United States Government Accountability Office

GAO

Report to the Subcommittee on Transportation, Treasury, the Judiciary, Housing and Urban Development, and Related Agencies, Committee on Appropriations, U.S. Senate

August 2006

ONDCP MEDIA CAMPAIGN

Contractor's National Evaluation Did Not Find That the Youth Anti-Drug Media Campaign Was Effective in Reducing Youth Drug Use

GAO-06-818

August 2006

GAO
Accountability · Integrity · Reliability

Highlights

Highlights of GAO-06-818, a report to the Chairman and Ranking Member, Subcommittee on Transportation, Treasury, the Judiciary, Housing and Urban Development, and Related Agencies, Committee on Appropriations, U.S. Senate

Why GAO Did This Study

Between 1998 and 2004, Congress appropriated over $1.2 billion to the Office of National Drug Control Policy (ONDCP) for the National Youth Anti-Drug Media Campaign. The campaign aimed to prevent the initiation of or curtail the use of drugs among the nation's youth. In 2005, Westat, Inc., completed a multiyear national evaluation of the campaign.

GAO has been mandated to review various aspects of the campaign, including Westat's evaluation which is the subject of this report. Applying generally accepted social science research standards, GAO assessed (1) how Westat provided credible support for its findings and Westat's findings about (2) attitudes, beliefs, and behaviors of youth and parents toward drug use and (3) youth self-reported drug use.

What GAO Recommends

Given that Westat's evaluation stated the campaign did not reduce youth drug use nationally, Congress should consider limiting appropriations for the campaign, beginning in the 2007 fiscal year budget until ONDCP provides credible evidence of a media campaign approach that effectively prevents and curtails youth drug use. ONDCP's written comments on our report generally disagreed with the findings. Specifically, ONDCP does not believe the Westat findings reflect the campaign's effectiveness. We believe the Westat study is sound.

www.gao.gov/cgi-bin/getrpt?GAO-06-818.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Laurie Ekstrand, (202) 512-8777, ekstrandl@gao.gov.

ONDCP MEDIA CAMPAIGN

Contractor's National Evaluation Did Not Find That the Youth Anti-Drug Media Campaign Was Effective in Reducing Youth Drug Use

What GAO Found

GAO's review of Westat's evaluation reports and associated documentation leads to the conclusion that the evaluation provides credible evidence that the campaign was not effective in reducing youth drug use, either during the entire period of the campaign or during the period from 2002 to 2004 when the campaign was redirected and focused on marijuana use. By collecting longitudinal data—i.e., multiple observations on the same persons over time—using generally accepted and appropriate sampling and analytic techniques, and establishing reliable methods for measuring campaign exposure, Westat was able to produce credible evidence to support its findings about the relationship between exposure to campaign advertisements and both drug use and intermediate outcomes. In particular, Westat was able to demonstrate that its sample was not biased despite sample coverage losses, maintained high follow-up response rates of sampled individuals to provide for robust longitudinal analysis, established measures of exposure that could detect changes in outcomes on the order of magnitude that ONDCP expected for the campaign and that could reliably measure outcomes, and used sophisticated statistical methods to isolate causal effects of the campaign.

Westat's findings on the effects of exposure on intermediate outcomes—theorized precursors of drug use—were mixed. Specifically, although sampled youth and parents' recall of campaign advertisements increased over time, they had good impressions of the advertisements, and they could identify the specific campaign messages, exposure to the advertisements generally did not lead youth to disapprove of using drugs and may have promoted perceptions among exposed youth that others' drug use was normal. Parents' exposure to the campaign led to changes in beliefs about talking about drug use with their children and the extent to which they had these conversations with their children. However, exposure did not appear to lead to increased monitoring of youth. Moreover, the evaluation was unable to demonstrate that changes in parental attitudes led to changes in youth attitudes or behaviors toward drug use.

Westat's evaluation indicates that exposure to the campaign did not prevent initiation of marijuana use and had no effect on curtailing current users' marijuana use, despite youth recall of and favorable assessments of advertisements. Although general trend data derived from the Monitoring the Future survey and the Westat study show declines in the percentage of youth reportedly using marijuana from 2002 to 2004, the trend data do not explicitly take into account exposure to the campaign, and therefore, by themselves, cannot be used as evidence of effectiveness. In Westat's evaluation of relationships between exposure and marijuana initiation the only significant finding was of small unfavorable effects of the campaign exposure on marijuana initiation during some periods of data collection and in some subgroups.

Contents

Letter 1

Results in Brief 5
Background 8
Westat's Evaluation Design, Use of Generally Accepted and Appropriate Sampling and Analytic Techniques, and Reliable Methods for Measuring Campaign Exposure Produced Credible Evidence to Support Its Findings 22
The Phase III Evaluation Provided Mixed Evidence of the Campaign's Effectiveness on Intermediate Outcomes, but It Found No Effect of the Campaign on Parental Monitoring of Youth 32
The Phase III Evaluation Found No Significant Effects of Exposure to the Campaign on Youth Drug Use Outcomes Other than Limited Unfavorable Effects on Marijuana Initiation 37
Conclusions 42
Matter for Congressional Consideration 44
Agency Comments and Our Evaluation 44

Appendix I **Westat's Methods for Addressing Evaluation Implementation Issues** 52

Appendix II **Comments from the Office of National Drug Control Policy** 65

Appendix III **GAO Contacts and Staff Acknowledgments** 72

Tables

Table 1: Appropriations for the National Youth Anti-Drug Media Campaign, Fiscal Years 1998 through 2006 10
Table 2: NSPY Survey Rounds and Response Rates, Sampled and Surveyed Youth 56

Figures

Figure 1: Data Collection Rounds and Waves of the NSPY 15

Abbreviations:

CPS	Current Population Survey
GRP	gross rating points
MTF	Monitoring the Future
NIDA	National Institute on Drug Abuse
NIP	National Immunization Program
NIS	National Immunization Survey of Children
NLSY	National Longitudinal Survey of Youth
NSDUH	National Survey on Drug Use and Health
NRC	National Research Council
NSPY	National Survey of Parents and Youth
OMB	Office of Management and Budget
ONDCP	Office of National Drug Control Policy
PART	Performance Assessment Rating Tool
PATS	Partnership for a Drug Free America's Attitude Tracking Survey
PDFA	Partnership for a Drug Free America
PME	Performance Measures of Effectiveness
YRBSS	Youth Risk Behavior Surveillance System

This is a work of the U.S. government and is not subject to copyright protection in the United States. It may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.

GAO
Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, DC 20548

August 25, 2006

The Honorable Christopher Bond
Chairman
The Honorable Patty Murray
Ranking Member
Subcommittee on Transportation, Treasury, the Judiciary,
Housing and Urban Development, and Related Agencies
Committee on Appropriations
United States Senate

Congressionally mandated under the Treasury and General Government Appropriations Act of 1998,[1] the National Youth Anti-Drug Media Campaign had the primary goals of preventing the initiation of drug use—particularly the use of entry-level drugs marijuana and inhalants—among the nation's youth and stopping youth that have begun using drugs from continuing their use. Administered through the Office of National Drug Control Policy (ONDCP) and implemented in three phases, the campaign featured as its centerpiece a paid advertising effort in which campaign funds were used to purchase media time and space for advertisements that delivered anti-drug messages to the campaign's target audience—youth aged 9 to 18 and their parents—through strategic placement of anti-drug advertisements on television and radio and in print media. In addition to the advertising, the campaign included community outreach, work with the entertainment industry to encourage the accurate depiction of the consequences of drug use, outreach to faith-based organizations, and work with youth organizations. The campaign's first two phases, which ran from January 1998 through the summer of 1999, were pilot phases that focused primarily on informing the planning and development for phase III and included a 12-city pilot (phase I) and nationwide advertising (phase II). Phases I and II aimed to increase public awareness of anti-drug messages. Phase III of the campaign, which began in mid-1999, continued the nationwide advertising campaign begun during phase II and integrated the advertising with outreach efforts. From fiscal year 1998 through fiscal year 2006, Congress appropriated over $1.4 billion to support the campaign. For fiscal year 2007, the President's budget requested $120 million for the campaign, an increase over the fiscal year 2006 appropriation, to purchase

[1]Pub. L. No. 105-61, 111 Stat. 1272.

additional media time and space to increase the reach and frequency of the campaign's messages, which would restore appropriations to their fiscal year 2005 level.

Congress first authorized funding for the campaign in fiscal year 1998 with the expectation that demonstrable changes in youth drug behaviors would be apparent within 3 years, and Congress required ONDCP to assess whether the campaign's efforts have been effective in changing the drug use behaviors of America's youth. ONDCP also indicated that it anticipated that it would take 2 to 3 years for the campaign to affect drug use behavior, although ONDCP also indicated that it was with the implementation of phase III of the campaign, beginning in mid-1999, that ONDCP expected to see improvements in anti-drug attitudes that would lead to decreases in youth drug use within 3 years. We previously reported that ONDCP's evaluations of the first two phases of the campaign produced inconclusive results because of various evaluation implementation problems and limitations of the analyses used to support findings about effects during these pilot phases.[2] In particular, we noted that the impact evaluations of phases I and II did not adequately gauge the overall level of anti-drug awareness generated by the campaign—the principal outcome measure for these two phases—and we identified site selection problems, unknown parent response rates, low school response rates, and data analysis issues contributing to the inconclusive results.

To implement the phase III evaluation, ONDCP entered into an interagency agreement with the National Institute on Drug Abuse (NIDA), which in turn awarded contracts to Westat, Inc., through June 2005 for $42.7 million to conduct the evaluation. Westat subcontracted with the Annenberg School for Communication at the University of Pennsylvania, and staff from Westat and Annenberg were coprincipal investigators for

[2]See: GAO, *Anti-Drug Media Campaign: ONDCP Met Most Mandates, but Evaluations of Impact Are Inconclusive*, GAO/GGD/HEHS-00-153 (Washington, D.C.: July 31, 2000). We also reported on ONDCP's use of consultants in the campaign in GAO, *Anti-Drug Media Campaign: An Array of Services Was Provided, but Most Funds Were Committed to Buying Media Time and Space*, GAO-05-175 (Washington, D.C.: Mar. 31, 2005). We also described the phase III evaluation in GAO, *Program Evaluation: Strategies for Assessing How Information Dissemination Contributes to Agency Goals*, GAO-02-923 (Washington, D.C.: Sept. 30, 2002).

the study.[3] Westat's phase III evaluation covered the period from September 1999 through June 2004 and studied the impact of the effectiveness of the nationwide campaign in reaching its target audience; affecting youth beliefs, attitudes, intentions, and behaviors with regard to drug use; and affecting their parents' beliefs and attitudes toward drug use and affecting parents' behaviors associated with interacting with their children and monitoring their activities.

Westat evaluated the campaign using a longitudinal panel survey—the National Survey of Parents and Youth (NSPY)—that aimed to measure the campaign's effectiveness by assessing changes in various outcomes within individuals over time in relation to their exposure to campaign messages. Westat's evaluation assessed the effect of exposure to the campaign on youth drug use and on several key intermediate outcomes—such as youth and parent attitudes toward and beliefs about drug use and parental involvement with their children—that were believed to influence youth drug use. In conducting the evaluation, Westat submitted several interim reports that were used in part to inform decisions about the direction of the campaign. Westat submitted a draft of the final evaluation report to NIDA in February 2005.[4]

Both Congress and ONDCP recognized the need for a separate evaluation of the campaign, because of limitations associated with existing national surveys of drug use. Congressional conferees acknowledged their intention to rely on the evaluation to gauge the impact of the campaign, and also indicated that if the campaign failed to show its effectiveness, they would be compelled to reevaluate the use of taxpayer money to support it. ONDCP acknowledged that existing national surveys of drug use would not be able to answer the critical question of whether changes in drug use behavior and attitudes were the result of the campaign. These surveys do not ask respondents about their exposure and reactions to the messages of the campaign that can then be linked to their drug-related attitudes and behavior. For example, in a 2001 report on youth drug use and the campaign, ONDCP officials noted that while national surveys of

[3]Hereafter, we refer to the contractor as "Westat," and this implicitly includes Annenberg. In addition, a second subcontractor, the National Development and Research Institutes, Inc., provided expertise in developing drug use questions and assisted in preparing the first special topics report on trends in drug use.

[4]Westat and Annenberg jointly submitted to NIDA all evaluation reports except for the final report, which was submitted by Westat only.

youth drug use showed flattening or declining youth marijuana use in 1999 and 2000 and these trends suggested that the campaign may be having the desired impact, it was necessary to await the results of the campaign's independent evaluation before drawing any definitive conclusions regarding the campaign's contribution to changes in youth drug use.

In a committee report for the fiscal year 2004 appropriations cycle, the Senate Appropriations Committee directed us to review how consultants were used in support of the media campaign.[5] This is the second of two reports responding to this mandate.[6] The first report provided information concerning ONDCP's use of consultants in the campaign. This second report addresses three questions related to Westat's evaluation of phase III of the media campaign: (1) How did Westat ensure that it could report credible results in its evaluation of the campaign? (2) What did the evaluation find about the effect of exposure to the campaign on key intermediate outcomes that were intended to lower youth drug use? (3) What did the evaluation find about the effect of exposure to the campaign on youth drug use?

In addressing our objectives, a team of GAO social scientists reviewed and assessed materials related to Westat's phase III evaluation, applying generally accepted social science research standards, including such elements as when and how the sample data were collected, adjustments made to the sample to address nonresponse, how program effects were isolated (i.e., the use of statistical controls), and the appropriateness of outcome measures. The materials reviewed included interim and final evaluation reports, documentation and analyses provided by Westat to us in response to several sets of questions that we submitted about the details of its methodology, documentation pertaining to meetings of scientific panels that provided guidance on the evaluation, and documentation prepared by ONDCP about the design and implementation of the campaign. We conducted our work in accordance with generally accepted government auditing standards from October 2005 through June 2006.

[5]Senate Report No. 108-146, at 143 (2003).

[6]See GAO-05-175 for our review of ONDCP's use of consultants in the campaign.

Results in Brief

By collecting longitudinal data—i.e., multiple observations on the same persons over time—using generally accepted and appropriate sampling and analytic techniques, and establishing reliable methods for measuring campaign exposure, Westat was able to produce credible evidence to support its findings about the relationship between exposure to campaign advertisements and both drug use and intermediate outcomes. In implementing the study, Westat encountered problems that are common to large-scale longitudinal studies, and it addressed those using methods that are generally recognized as appropriate approaches for the study implementation challenges Westat faced. Challenges that Westat encountered were (1) lack of baseline data, which precluded Westat from comparing postprogram outcomes to preprogram conditions, and the redirection of the campaign; (2) sampling concerns, particularly ensuring the coverage of eligible households with youth in the targeted age range and ensuring that attrition over successive survey cycles did not result in insufficient sample size to detect campaign effects or in systematic bias within the sample; (3) establishing measures that would allow for both the sufficient detection of and the reliable measurement of exposure to the campaign on NSPY survey respondents; and (4) disentangling causal effects of exposure and drawing meaningful comparisons in the absence of ability to employ an experimental design where NSPY respondents would have been randomly assigned to various levels of exposure—the generally preferred approach for assessing program effects, where possible. Our examination of Westat's evaluation report and related documentation leads us to conclude that it addressed each of these challenges sufficiently to allow it to report credible findings about the effect of campaign exposure on drug use and intermediate variables believed to be precursors to drug use. Specifically, (1) several factors suggest that the lack of baseline data was not fatal to the evaluation's findings, and Westat was able to generate statistically significant findings related to the redirected campaign; (2) Westat found no evidence of bias in the NSPY estimates despite sample coverage losses, and it also maintained high follow-up response rates of sampled individuals to provide for robust longitudinal analysis; (3) the NSPY sample could be used to detect changes in outcomes that were on the order of magnitude of changes that ONDCP expected for the campaign, and Westat demonstrated that its measures of exposure were valid and could reliably predict outcomes, whether results of the associations between exposure and outcomes were favorable or unfavorable to the campaign; and (4) using sophisticated statistical methods, Westat matched respondents on their underlying propensity to be exposed to campaign advertisements and, by comparing differences in outcomes among groups with different levels of exposure

resulting from its matching methods, isolated the effects of the campaign from other variables. (See appendix I for further details.)

For intermediate outcome measures thought to influence the ultimate target of the campaign, youth drug use—for example, recall and identification of campaign messages, youth anti-drug attitudes, and parents' beliefs and behaviors—Westat found favorable effects for some measures and subgroups, as well as unfavorable effects and no significant effects for others. In general, both youth and parents' recall of specific campaign messages increased over the life of the campaign. In addition, NSPY trend data showed some increasing trends in anti-drug attitudes and beliefs as well as the proportion of youth who reported never intending to try marijuana. However, cross-sectional and longitudinal analysis provided no evidence that these trends resulted from campaign exposure. Westat's analysis also indicated that among current, non-drug-using youth, exposure to the campaign had unfavorable effects on their anti-drug norms and perceptions of other youths' use of marijuana—that is, greater exposure to the campaign was associated with weaker anti-drug norms and increases in the perceptions that others use marijuana. Data for parents in the NSPY on five intermediate measures show some favorable effects of campaign exposure on parents' behaviors and beliefs. However, for a major aim of the campaign, affecting parental behaviors regarding monitoring their children's whereabouts, activities, and friends, Westat found no evidence of a significant effect. Moreover, where the data showed favorable relationships between campaign exposure and parental beliefs and behaviors, Westat did not find that these effects on parents ultimately lead to corresponding changes in their children's beliefs and behaviors.

Westat's evaluation found no significant favorable effects of campaign exposure on marijuana initiation among non-drug-using youth or cessation and declining use among prior marijuana users. Westat's NSPY data did show some declining trends in self-reported lifetime and past-month use of marijuana by youth over the period from 2002 to 2004 and declining trends in youth reports of offers to use marijuana. Declining drug use trends in the NSPY were consistent with trends in other national surveys of drug use over these years. However, Westat cautioned that because trends do not account for the relationship between campaign exposure and changes in self-reported drug use, trends alone should not be taken as definitive evidence that the campaign was responsible for the declines. ONDCP has also acknowledged the limitation of drug use trends for the purpose of demonstrating a causal link between campaign exposures and declines in drug use trends. Westat's analysis of the relationship between exposure to

campaign advertisements and youth self-reported drug use in the NSPY data for the entire period covered by its evaluation—assessments that used statistical methods to adjust for individual differences and control for other factors that could explain changes in self-reported drug use—showed no significant effects of exposure to the campaign on initiation of marijuana by prior nonusing youth. Westat's analysis found significant unfavorable effects—that is, a relationship between campaign exposure and higher rates of initiation—during one round of NSPY data and for the whole period of the campaign among certain subgroups of the sample (e.g., 12 ½- to 13-year-olds and girls). Westat found no effects of campaign exposure on rates of quitting or use by prior users of marijuana.

In light of the fact that the phase III evaluation of the media campaign yielded no evidence of a positive outcome in relation to teen drug use and congressional conferees' indications of their intentions to rely on the Westat study, Congress should consider limiting appropriations for the National Youth Anti-Drug Media Campaign beginning in the fiscal 2007 budget year until ONDCP is able to provide credible evidence of the effectiveness of exposure to the campaign on youth drug use outcomes or provide other credible options for a media campaign approach. In this regard we believe that an independent evaluation of the new campaign should be considered as a means to help inform both ONDCP and Congressional decision making.

We provided a draft of this report to the Director of ONDCP for comment. In response, ONDCP provided written comments (reproduced in appendix II), which stated that ONDCP was puzzled that we did not make recommendations to it about how to improve the campaign. However, the main purpose of our report was to assess Westat's evaluation rather than to comment on how to improve the media campaign. In so doing, we focused on Westat's methods. Our role was to inform Congress about the reliability of Westat's evaluation so that Congress could decide the extent to which it will continue to fund the campaign.

ONDCP expressed a number of concerns about our assessment of Westat's evaluation and its implications concerning the effectiveness of the campaign. Most importantly, it stated that the Westat study is ill suited to assess impact and the study's findings are of limited relevance. Our extensive review of the Westat study does not support ONDCP's conclusion. Westat successfully addressed implementation challenges and used sophisticated analytic techniques to develop its findings. Another major issue ONDCP presents in its comments deals with the fact that the campaign has made major changes since the Westat data collection,

rendering the study's findings irrelevant. Neither we nor ONDCP has factual data upon which to base an assessment of the effectiveness of the current campaign. However, other major efforts to substantially change the campaign during the time frame of the Westat data collection did not yield positive results. ONDCP raised a number of other issues that are generally related to the issues discussed above. These are addressed in the Agency Comments and Our Evaluation section of this report.

Background

The National Youth Anti-Drug Media Campaign

As part of the Treasury and General Government Appropriation Act of 1998,[7] the Drug Free Media Campaign Act of 1998 required, among other things, the Office of National Drug Control Policy to conduct a national media campaign for the purpose of reducing and preventing drug abuse among young people in the United States.[8] The National Youth Anti-Drug Media Campaign may be the most visible federal effort devoted to preventing drug use among the nation's youth. It aims to educate and enable America's youth to reject illegal drugs; to prevent youth from initiating use of drugs, especially marijuana and inhalants; and to convince occasional users of these and other drugs to stop using drugs. Administered by ONDCP, and implemented in three phases, the campaign has as its centerpiece a paid advertising effort in which campaign funds were used to purchase media time and space for advertisements that delivered anti-drug messages to the campaign's target audiences—youth aged 9 to 18 and their parents and adult caregivers—through strategic placement of anti-drug advertisements on television and radio and in print media.

The campaign's first two phases were pilot phases that had as their objectives developing advertising concepts, creating limited advertisements, testing public awareness of the advertisements in 12 metropolitan areas, and eventually extending the pilot program nationwide. Phase III of the campaign, which began in mid-1999, continued the nationwide advertising campaign begun during phase II and integrated

[7]Pub. L. No. 105-61, 111 Stat. 1272.

[8]Drug Free Media Campaign Act of 1998, 21 U.S.C. § 1801 et. seq.

the advertising with outreach efforts. In addition to the advertising, the fully integrated phase III campaign included community outreach, work with the entertainment and media industries to encourage the accurate depiction of the consequences of drug use, outreach to faith-based organizations, and work with youth organizations.

During phase III, ONDCP had overall responsibility for developing and implementing the campaign, and to do so, it enlisted the support of nonprofit organizations, trade associations, private businesses, and federal agencies. Appropriated media campaign funds were to be used to cover the costs of actually making the advertisements as well as the costs for planning of purchase of media time and space. The campaign also included public outreach and specialized communications efforts. The purpose of public outreach and communications was to extend the reach and influence of the campaign through nonadvertising forms of marketing communications. Examples of these nonadvertising forms of communication included submitting articles related to key campaign messages such as effective parenting or the effects of marijuana on teen health to newspapers and magazines; building partnerships and alliances, for example, coordinating positive activities for teens with local schools and community groups; creating Web sites and exploring alternative media approaches; and entertainment industry outreach.

According to the campaign's communications strategy, youth aged 9 to 18 were segmented into three school and age risk-level categories: late elementary school adolescents, aged 9 to 11; middle school children, aged 11 to 13; high school youth, ages 14 to 18. The campaign originally targeted youth aged 9 to 18 with a focus on middle school age adolescents (roughly 11-to 13-year-olds); its secondary focus was on high school-aged youth (approximately 14 to 18 years of age). In 2001, the campaign shifted its creative focus to 11- to 14-year-olds in order to more effectively reach youth at the time they are most at risk for trying drugs. In 2002, the campaign altered its target age group to focus primarily on 14- to 16-year-olds. For all age groups, the communications strategy identified the primary focus of the campaign as at-risk nonusers and occasional users of drugs. For all groups, it was designed to give consideration to differences arising from gender, race, ethnicity, and regional and population density factors.

From fiscal year 1998 through fiscal year 2004, Congress appropriated $1.225 billion to support the campaign (table 1).

Table 1: Appropriations for the National Youth Anti-Drug Media Campaign, Fiscal Years 1998 through 2006

Fiscal year	Final appropriations (in millions of dollars)
1998	$195
1999	$185
2000	$185
2001	$185
2002	$180
2003	$150
2004	$145
2005	$120
2006	$100
Total, 1998 through 2006	$1,445
Total, 1998 through 2005	$1,345
Total, 1998 through 2004	$1,225

Sources: Appropriations Acts from various years.

Note: Appropriated amounts are prerescission amounts. For example, rescissions were 0.38 percent in fiscal year 2000, 0.22 percent in fiscal year 2001, 0.65 percent in fiscal year 2003, and 0.59 percent in fiscal year 2004.

For fiscal year 2007, the President's budget requested $120 million for campaign activities. The 2007 request represents an increase of $21 million above the fiscal year 2006 budget authority. The additional resources were requested to help to purchase additional media time and space to increase the reach and frequency of the campaign's messages.

Planning and the Underlying Logic of the Campaign

According to ONDCP, its planning for the campaign's communications strategy included reviews of published studies on the etiology and prevention of adolescent drug use, drug prevention campaigns, other public health campaigns, and general consumer marketing campaigns targeting youth and their parents. ONDCP also supplemented its research evidence with an extensive expert consultation process that included input from over 200 experts in academia, civic and community organizations, government agencies, and the private sector. A campaign design expert panel that included experts in the fields of drug use and prevention, public health communication, advertising, market research, consumer marketing, and public policy met over a 4-day period during the fall of 1997 and played a key role in integrating diverse sources of

information and guiding the development of the communications strategy for the campaign.

The planning process resulted in a statement of ONDCP's communications strategy for the campaign, which described the premises of the campaign. Among these were the following: First, that the media can influence people in a variety of ways, such as informing and alerting them to important developments and shaping subsequent actions; satisfying leisure time needs, thereby influencing individuals' views and beliefs about the world; and stimulating interest in commercial goods and services, thereby influencing where and how people shop. Second, that media messages have more potential to reinforce rather than to alter existing attitudes and beliefs. Third, to the extent that youth attitudes, beliefs, and intentions toward drug use vary with their age, the potential of a media campaign to influence drug use may be directly related to the age of the youth. Fourth, the campaign had to be sustained over time and to have a significant media presence, and its central messages have to be repeated often and in a variety of ways. Citing research showing that attitudinal and behavioral change took time to occur, ONDCP reported that it expected to observe "improvements in anti-drug attitudes that would lead to decreases in youth drug use within three years" of the implementation of phase III of the campaign. Fifth, as parents and adult caregivers play a vital role in youth drug use behaviors, and by also targeting parents, the campaign would aim to affect the nature of their interaction with their children, thereby strengthening their children's capacity to resist using illicit drugs.

The campaign focused on primary prevention—that is, preventing those who did not use drugs from starting to use drugs. According to ONDCP, a media campaign that focused on primary prevention targets the underlying causes of drug use and therefore has the greatest potential to reduce the scope of the problem over the long term. Further, a primary prevention campaign also has greater potential to affirm and reinforce anti-drug attitudes of nonusers than to persuade experienced users to change their behaviors, and a primary prevention campaign would also, over time, lessen the need for drug treatment services. With a focus on young, non-drug-using adolescents, an expectation underlying the campaign's potential success was that as these young, non-drug-using adolescents aged, the campaign's messages would intervene, retard the development of more pro-drug attitudes, and enable adolescents to continue to maintain their preexisting anti-drug attitudes. By maintaining these attitudes, or preventing the development of pro-drug sentiments, the campaign would affect drug use rates by lowering the rate at which youth initiated drug use, particularly the use of marijuana or inhalants.

The campaign was designed to have a significant and sustained media presence. During planning, ONDCP acknowledged that the campaign would have to be sustained for a period of time sufficient to bring about a measurable change in the beliefs and behaviors of youth in the target audience. On the basis of the experiences of successful social marketing campaigns, ONDCP reported that it expected that changes in awareness or recall of the campaign would be detectable within a few months of the start of the campaign, that changes in perceptions and attitudes would be detectable within 1 to 2 years of the start of the campaign, and that changes in behavior would be detectable within 2 to 3 years.

Campaign Activities during Phase III

From mid-1999, the start of phase III, through June 2004, the end of the phase III evaluation, campaign activities included extensive media dissemination of campaign messages to a national audience of youth and parents; an interactive media component, which involved using content-based Web sites and Internet advertising; use of experienced individuals and organizations with expertise in marketing to teens, advertising and communications, behavior change, and drug prevention to inform the campaign strategy and implementation; use of multicultural initiatives that focused on sufficiently exposing campaign messages to African Americans, Asian Americans, Pacific Islanders, Hispanic Americans, American Indians, and Alaskan Natives; and the implementation of the integrated social marketing and public health communications campaign through the creation of partnerships with civic, professional, and community groups and outreach to media, entertainment, and sports industries. Through the partner organizations, the campaign attempted to strengthen local anti-drug efforts, and through outreach, it encouraged the news media to run articles that conveyed campaign messages. Youth and parent exposure to campaign messages could come from the direct, paid and donated advertising or from content delivered by news media and entertainment industries through the outreach efforts. Additional opportunities for exposure to anti-drug messages could be enhanced through personal involvement with organizations that became partners as a result of campaign outreach or by interaction with the campaign's Web site. Further, youth exposure to anti-drug messages could also occur through interactions with friends, peers, parents, or other adults that occurred directly from either campaign ads or outreach efforts.

Campaign Themes and Messages

Campaign messages for both youth and their parents and caregivers were to focus on common transitions—such as the transition from elementary to secondary school—and common situations—such as the amount of time spent in settings without adult supervision—that were believed to heighten adolescents' vulnerability to drug use initiation. In addition, messages were to focus on altering mediating variables—such as beliefs and intentions—that were known to have a significant impact on adolescent drug use. Finally, campaign messages were designed to create a "brand identity" in the minds of target audience members and through brand identity position campaign messages as credible and important. Throughout phase III, themes such as parents as "The Anti-Drug" and the "My Anti-Drug" theme for youth were designed to promote identification and positive associations with the campaign's messages.

While they evolved throughout the campaign, the central strategic messages or themes for youth focused on resistance skills and self-efficacy to refuse drugs, normative education and positive messages, negative consequences of drug use, and early intervention. Resistance skills and self-efficacy advertisements were designed to enhance the personal and social skills of youth that promote lifestyle choices and to help build youth's confidence that they could resist drugs. Normative education themes attempted to instill the beliefs that most young people do not use drugs or convey messages that "cool people don't use drugs," while positive message themes reinforced the idea of positive uses of time as alternatives to illicit drugs. Negative consequences themes aimed to enhance youth perceptions that drug use is likely to lead to a variety of negatively valued consequences, such as loss of parental approval, reduced performance in school, and negative social, aspirational, and health effects. Negative consequences themes were the primary focus of the Marijuana Initiative, which was introduced during 2002. An early intervention theme sought to motivate youth to intervene with friends who they perceived as having problems with drugs or alcohol and tried to convince youth of their ability to take action and to give them the tools and skills they needed to intervene.

For parents, the campaign's themes included messages that every child, including their own, was at risk of doing drugs; that they can learn parenting skills to help them help their children avoid drugs; that they need to be aware of the harmful effects of drugs including marijuana and inhalants; and, as part of the Early Intervention Initiative, that it was important that they intervene at the earliest possible opportunity in their child's life if their child was using drugs or alcohol.

Design of the Evaluation, Interim Evaluation Reports, and Redirection of the Campaign

ONDCP recognized the need for a separate evaluation of the campaign and for ongoing reporting of evaluation results. The need for a separate evaluation stemmed in part from the limitations of existing national surveys that monitor drug use, such as Monitoring the Future, which provides data on drug use by high school students, the National Household Survey on Drug Abuse,[9] and the Youth Risk Behavior Survey, which addresses health risk behaviors including drug use. These recurring surveys provide very little information with which to evaluate the impact of the campaign, because they were not designed to evaluate it. As ONDCP has written, these surveys contain no questions about target audience exposure and response to the campaign, and as a result, any changes in attitudes, beliefs, and behaviors toward drug use could not be associated directly with the campaign. By comparison, ONDCP acknowledged that it was using the Westat evaluation to assess the extent to which changes in anti-drug attitudes and beliefs or drug-using behavior can be attributed to the campaign, as opposed to other socioeconomic factors. In addition, ONDCP indicated that for the campaign, data from Westat's evaluation would enable ONDCP to assess whether the campaign is working.

The primary tool of the Westat evaluation was the National Survey of Parents and Youth. The NSPY is a longitudinal panel study of children and their parents' exposure and response to the campaign. The NSPY was designed to collect initial and follow-up data from nationally representative samples of youth aged 9 to 18 and from the parents of these youth. The sample was designed to represent youth living in homes in the United States and their parents. Data collection began in November 1999 and was conducted over four rounds—each of which was about 1 year apart from the next round—in nine waves of interviews. An interview wave refers to the fielding of a survey round to a specific subsample in the NSPY. An interview round refers to the completion of interviews with the entire sample. Data for each of the nine waves were collected using a laptop computer and a combination of computer-assisted interview technologies. To collect sensitive data, audio computer-assisted self-interview technology was used, allowing respondents to self-administer the questionnaire in total privacy. The final wave of data collection was completed in June 2004 (fig. 1). Eligible youth and parents were to be interviewed four times.

[9]The survey is now known as the National Survey on Drug Use and Health.

Figure 1: Data Collection Rounds and Waves of the NSPY

Phase of data collection	Survey round	Survey wave	Data collection period	Cohorts (groups) of youth and parents interviewed in specific survey waves
Recruitment phase	Round 1	Wave 1	11/99–5/00	Group A, recruitment interview
		Wave 2	7/00–12/00	Group B, recruitment interview
		Wave 3	1/01–6/01	Group C, recruitment interview
Follow-up phase	Round 2	Wave 4	7/01–12/01	Group A, first follow-up interview
		Wave 5	1/02–6/02	Group B, first follow-up interview; Group C, first follow-up interview
	Round 3	Wave 6	7/02–12/02	Group A, second follow-up interview
		Wave 7	1/03–6/03	Group B, second follow-up interview; Group C, second follow-up interview
	Round 4	Wave 8	7/03 – 12/03	Group A, third follow-up interview
		Wave 9	1/04–6/04	Group B, third follow-up interview; Group C, third follow-up interview

Source: Adopted from Westat, 2005, Vol. 2: Appendices.

The evaluation aimed to assess whether exposure to the campaign affected the self-reported knowledge, attitudes, beliefs, and drug use of youth. Because the campaign reached out to all youth nationwide, the evaluators could not assess its effects using experimental methods, in which some subjects are randomly assigned to the intervention and others are randomly assigned to control groups that were not exposed to the intervention. Westat's evaluation was designed to take into account the variation in self-reported exposure to the campaign messages and to assess how this variation in exposure was correlated with outcomes that the campaign intended to affect. To attribute changes in drug use attitudes and behaviors to the campaign, the evaluation was designed to assess exposure to the campaign and to compare differences in outcomes for groups of persons that were exposed to varying levels of the campaign's

messages, and to use statistical controls to account for individual-level differences among survey respondents.

Westat's evaluation assessed youth self-reported drug use and intermediate outcomes—such as youth and parent attitudes and beliefs toward drug use and parental involvement with their children—that were believed to influence youth drug use. The evaluation of phase III addressed issues related to (1) whether the campaign was reaching its target populations, (2) whether the desired outcomes moved in favorable or unfavorable directions, (3) whether the campaign was influencing changes in the desired outcomes, and (4) what could be learned from the overall evaluation to support ongoing decision making for the campaign. These issues led to the five major objectives for the evaluation:

- to measure changes in drug-related knowledge, attitudes, beliefs, and behavior in youth and their parents;
- to assess the relationship between changes in drug-related knowledge, attitudes, beliefs, and behavior and self-reported measures of media exposure, including the salience of the measures;
- to assess the association between parents' drug-related knowledge, attitudes, beliefs, and behavior and those of their children;
- to assess changes in the association between parents' drug-related knowledge, attitudes, beliefs, and behavior and those of their children that may be related to the campaign; and
- to compare groups of people with high exposure to other groups with low exposure.

Westat submitted semiannual and special topic reports to NIDA, as the findings from these interim evaluation reports were to be used to support ongoing decision making for the campaign. Westat submitted the first semiannual report in November 2000. By December 2003, Westat had submitted six additional reports, four of which were labeled as semiannual reports, and the other two included a special report on historical trends in drug use and a 2003 report of findings.[10] Westat submitted its first draft of its final report to NIDA in February 2005.

In addition to Westat's evaluation of the relationship between exposure and outcomes, Westat also prepared a report on the environmental

[10]All of these reports were submitted jointly by Westat and Annenberg.

context of the campaign.[11] In May 2002, Westat reported findings from this qualitative study of views of representatives from major national organizations and state prevention coordinators about the messages conveyed by the campaign and the role of the campaign as an organizing partner in helping to bolster local substance abuse prevention efforts. According to Westat, representatives felt that the campaign's messages reinforced their own messages that encouraged youth to find healthy alternatives to drug use and to raise public awareness of the issue of illicit drugs among youth. Westat also reported that representatives were less enthusiastic about the role of the campaign as an organizational partner in helping with local substance abuse prevention efforts.

In November 2002, Westat submitted its fifth semiannual report to NIDA. In it, Westat reported that it found little evidence that the campaign had direct, favorable effects on youth self-reported drug use between 2000 and 2002. Specifically, Westat reported:

> "There is little evidence of direct favorable Campaign effects on youth. There is no statistically significant decline in marijuana use to date, and some evidence for an increase in use from 2000 to 2001. Nor are there improvements in beliefs and attitudes about marijuana use between 2000 and the first half of 2002. Contrarily, there are some unfavorable trends in youth anti-marijuana beliefs. Also there is no tendency for those reporting more exposure to Campaign messages to hold more desirable beliefs."[12]

Westat further reported that there were unfavorable delayed effects of campaign exposure on subsequent intentions to use marijuana and on other beliefs. By delayed effects, Westat referred to the relationship between exposure to the campaign measured in one survey round having an effect on intentions or beliefs outcomes at a subsequent survey round. For parents, Westat reported that the evidence was consistent with favorable campaign effects, as it found that there were favorable changes for three of five parents' belief and behavior outcome measures. However, Westat also reported that it found no evidence for favorable indirect

[11]Westat, "Environmental Context of the National Youth Anti-Drug Media Campaign: Findings from In-Depth Discussions with Representatives of National Organizations and State Prevention Coordinators." Report delivered to National Institute on Drug Abuse, National Institutes of Health, Rockville, Maryland, May 2002.

[12]Hornik, Robert, et al. *Evaluation of the National Youth Anti-Drug Media Campaign: Fifth Semi-Annual Report of Findings*, (Rockville, Maryland: Westat, November 2002), p. xi.

effects on youth behavior as the result of their parents' exposure to the campaign.

Congressional appropriators expressed concerns about the findings of Westat's fifth semiannual report. In the conference report for fiscal year 2003 omnibus appropriations, the conferees reported that they were "deeply disturbed by the lack of evidence that the National Youth Anti-Drug Media Campaign has had any appreciable impact on youth drug use."[13] The conferees further acknowledged that while the evaluation conducted under NIDA's auspices showed "slight and sporadic impact on the attitudes of parents, it has had no significant impact on youth behavior." The conferees further acknowledged that while other surveys of youth drug use—such as Monitoring the Future, a survey of high school youth—showed recent declines in drug use, "the NIDA study was undertaken to measure the specific impact of the Media Campaign, not simply to gauge general trends," and the conferees stated that they "intend to rely on the scientifically rigorous NIDA study to gauge the ultimate impact of the campaign" and to reevaluate the use of taxpayer money to support the campaign if the campaign continued to fail to demonstrate its effectiveness.

In 2002, the strategy for the campaign was redirected. In the spring, the target age group of the campaign became 14- to 16-year-olds—youth who have higher rates of marijuana initiation than younger youth—from its original targeting of 11- to 13-year-olds. The shift to teens in the 14- to 16-year-old range aimed to allow the campaign to more effectively reach youth during the time at which they are most at risk for trying drugs. ONDCP also required more rigorous copy test procedures of all television advertisements before they were aired, and ONDCP increased its oversight in guiding the development and production of advertisements. In October 2002, ONDCP launched a new initiative called the Marijuana Initiative. This initiative contained more focused advertising to address youth marijuana use. In a hearing before the House Committee on Government Reform, ONDCP announced that it would reverse the ratio of campaign advertising expenditures directed to adults and youth, respectively. Previously, about 60 percent of expenditures were directed to adults and 40 percent toward youth. Finally, during February 2004, it expanded the campaign's communications goals to include the Early Intervention Initiative. This intervention was targeted toward both parents and teen

[13]Conference Report No. 108-10, at 1345 (2003).

friends, and ONDCP intended to use parental and peer pressure to stop drug and alcohol use among teens.

Assessment of the Campaign by the Office of Management and Budget and ONDCP's Current Approach

To strengthen the linkages between resources and performance envisioned in the Government Performance and Results Act of 1993 (GPRA),[14] the Office of Management and Budget (OMB) developed the Program Assessment Rating Tool (PART) to bring performance information into the executive budget formulation process. PART is designed to determine the strengths and weaknesses of federal programs by drawing upon available program performance and evaluation data so that the federal government can achieve better results. The PART therefore looks at factors that affect and reflect program performance, including program purpose and design; performance measurement, evaluations, and strategic planning; program management; and program results. Because the PART includes a consistent series of analytical questions, it allows programs to show improvements over time and allows comparisons between similar programs.

OMB's PART rating of the campaign addressed issues related to its purpose and design, strategic planning, program management, and program results and accountability. OMB indicated that the purpose was clear—giving ONDCP a 100 percent score on this factor—and it rated the campaign's planning and management with scores of 67 percent and 70 percent, respectively. In its assessment of ONDCP's strategic planning, OMB noted that in response to its 2002 PART review, ONDCP revised the campaign's logic model and significantly changed its long-term and annual performance measures.

However, OMB's assessment rating for the campaign was "results not demonstrated." OMB indicated that its assessment of the campaign's progress toward both the long-term goals and annual performance goals will be reviewed against the results of the NIDA-managed evaluation. OMB noted that while there is no federal program closely comparable to the campaign, evaluations of other health behavior change efforts found short-term effects after exposure to media. While acknowledging that a final assessment of the effects of the campaign awaited the final report from the NIDA-managed evaluation, OMB also indicated that "outcome data from the evaluation suggest little or no direct positive effect on youth behavior

[14]Pub. L. No. 103-62, 107 Stat. 285 (1993).

and attitudes attributable to the campaign to date. Perhaps some positive effect on parental attitudes/behavior but that has not yet translated into an effect on youth."

ONDCP has credited the campaign, along with a variety of collective prevention efforts, with contributing to "significant success in reducing teen drug use, as evidenced by the 19 percent decline from 2001 to 2005." It has introduced a new youth brand approach to connect youth with aspiration themes. ONDCP also has indicated that while it awaits our formal assessment of the evaluation, that it will use existing national surveys to evaluate the campaign and suspend its request for proposals for a new evaluation contract. Specifically, ONDCP indicated that it would use the MTF survey to track improvements in perception of the risk of drug use—a predictor of lower drug use by youth—and it would use a special analysis of the PATS survey—the Partnership for a Drug-Free America's Attitude Tracking Survey—data on anti-drug messages. According to the 2005 data from MTF, there were no significant 1-year declines in marijuana use for youth in any grade levels, and while gradual declines in the upper grades continued, declines halted for youth in the 8th grade. Additionally, for 8th graders, perceived risk of marijuana use held steady, while for youth in 10th and 12th grade, there was an increase in perceived risk of marijuana use.

Recent Research on the Effects of the Campaign in Local Settings

Two recently released studies have reported that exposure to the campaign was associated with changes in past-month marijuana use under certain conditions for certain groups of students exposed to the campaign. In one of the studies,[15] 45 South Dakota high schools and their middle-school feeder(s) were randomly assigned to three groups: (1) a basic prevention curriculum, (2) a group given this curriculum with booster lessons, and (3) a control group. All schools were exposed to the campaign during the fall of 1999 and spring of 2000. This permitted the researchers to test for a synergistic effect between exposure to the campaign's anti-drug messages and participation in the school-based drug prevention curriculum. The sample of about 4,100 youth were asked how often they had seen anti-drug advertisements in recent months in five media outlets that were used by the campaign, and the researchers

[15]Longshore, Douglas, et al., "National Youth Anti-Drug Media Campaign and School-Based Drug Prevention: Evidence for a Synergistic Effect in ALERT Plus," *Addictive Behaviors*, Vol. 31, (2006) pp. 496-508.

measured exposure to the campaign that indicated whether or not the adolescents reported seeing ads at least one to three times per week in any of the five media outlets. Consistent with Westat's fifth interim report, the evaluation of the South Dakota drug prevention curriculum found no direct effects of exposure to the campaign on its sample of adolescents' use of illegal drugs. However, the evaluation also found that marijuana use in the past month was significantly less likely among adolescents who received both the curriculum with booster lessons and weekly exposure to the campaign's messages. In other words, neither the enhanced curriculum nor the campaign alone had a substantial effect on marijuana use in the absence of the other. In addition, this evaluation's measure of exposure was based on weekly exposure, suggesting that the synergistic effect of the campaign observed in these South Dakota schools was based on the delivery of repeated messages.

The second study used monthly random samples of 100 youth from the enrollment lists of 4th to 8th graders in the public schools in the spring of 1999 in two moderate-sized communities—Fayette County (Lexington), Kentucky, and Knox County (Knoxville), Tennessee—over 48 months from April 1, 1999, through March 31, 2003.[16] The study period included advertisements aired under the campaign's Marijuana Initiative. Students in the samples aged over time and were 13 to 17 years of age at the beginning of the Marijuana Initiative. Youth in the samples were measured on marijuana use during the past 30 days, as well as on their attitudes toward marijuana. Exposure to television and radio advertisements was measured by self-reported past-month exposure. The study found that among high-sensation-seeking youth—that is, youth who desire novel, complex, and intense sensations and experiences and who are willing to take social risks to obtain them—exposure to the first 6 months of the campaign's Marijuana Initiative led to reductions in marijuana use. The study's authors reasoned that the effects that they found for the Marijuana Initiative were consistent with an approach termed SENTAR (for sensation-seeking targeting), in which high-sensation-seeking youth are targeted with high sensation value messages to prevent risky behaviors.

[16]Palmgreen, Philip, et al., "Effects of ONDCP's Marijuana Initiative Campaign on High Sensation-Seeking Youth." Paper presented to the American Public Health Association, Philadelphia, Pennsylvania, December 2005.

Westat's Evaluation Design, Use of Generally Accepted and Appropriate Sampling and Analytic Techniques, and Reliable Methods for Measuring Campaign Exposure Produced Credible Evidence to Support Its Findings

Westat was able to produce credible evidence to support its findings about the relationship between exposure to campaign advertisements and both drug use and intermediate outcomes by employing a longitudinal panel design—i.e., collecting multiple observations on the same persons over time—using generally accepted and appropriate sampling and analytic techniques and establishing reliable and sufficiently powerful measures of campaign exposure. Westat encountered various challenges and threats to validity that are commonly associated with large-scale longitudinal studies, including lack of an opportunity to use experimental methods, lack of baseline data, and changes in campaign focus that were not timed with data collection; issues with ensuring adequate sample coverage and controlling for sample attrition over time; establishing measures that were sufficient to detect and reliably measure campaign effects; and disentangling causal effects without being able to employ an experimental design where subjects would have been randomly assigned to different levels of exposure. Our review of Westat's evaluation report and associated documentation leads us to conclude that the design and methodology used in its evaluation responded appropriately to these challenges, resulting in credible findings.

Although Elements of the Campaign Limited Choices of Evaluation Designs and Affected Data Collection, Westat's Design Was Rigorous and Provided a Means to Test for Campaign Effects

The nationwide scope of the campaign precluded Westat from using experimental methods or obtaining baseline data, and the timing of the introduction of some new campaign initiatives limited some of the data available to evaluate them. However, Westat's longitudinal panel survey design provided a framework for developing strong evidence of within-respondent changes in outcomes over time as a result of exposure to the campaign. The consensus of a scientific panel convened by NIDA in August 2002 to review the evaluation was that Westat's use of a national probability sample to study change arising from the campaign was preferable as the "gold standard" to a study based on other alternatives, such as in-depth community-based studies of the mechanisms of change and campaign effects. Additionally, the theoretical underpinnings of behavioral change through advertising, along with statistically significant outcomes in some but not all groups, suggest that the absence of baseline data and introduction of new campaign initiatives did not invalidate the evaluation's findings. Finally, despite the introduction of new campaign initiatives that were not timed with data collection cycles, Westat was able to assess change in the NSPY data and generate statistically significant findings using these data.

Westat's longitudinal panel design was based on the premise that effects of exposure to the campaign on outcomes could be measured and detected

within individuals over time, after controlling for various other factors that could have influenced outcomes. The design called for measuring the same respondents up to four times to assess how the natural variation in exposure to the campaign correlated with campaign outcomes. Westat's approach—an exposure (or dose)-response model—is based upon a premise that respondents' recall of advertisements (exposure or dose) is related to outcomes (response). In two recent studies of the effects of the campaign on specific groups of youth in local areas, an exposure-response approach has been shown to be an effective method for detecting effects of the campaign in reducing youth drug use in local settings. One of the studies reported a synergistic effect of exposure to the campaign and a classroom-based drug prevention curriculum among 9th grade students in 45 South Dakota high schools. The other study reported reductions in drug use during the period of the redirected campaign among high-sensation-seeking youth in schools in Knoxville, Tennessee, and Lexington, Kentucky. To assess the possibility of preexisting differences between groups of exposed youth and parents that might explain both the variation in exposure to the campaign and variation in outcomes, Westat included in the NSPY structured interview many questions on personal and family history, and it used the responses to control statistically for differences in attributes of respondents in order to attempt to isolate the relationship between exposure to the campaign and outcomes.

The absence of baseline data—that is, precampaign data on outcomes—was beyond Westat's control, as phase III of the campaign began before the first wave of data collection for the phase III evaluation began. The lag between the start of phase III of the campaign in mid-1999 and the completion of the evaluation's first round of data collection—around mid-2001—leaves open the possibility that there were effects of the campaign that occurred very early on in the campaign, prior to when Westat began data collection. Several factors suggest that the absence of pre-phase III baseline data was not fatal to the evaluation's findings. First, if there were effects of the campaign that could not be detected because of the absence pre-phase III baseline data, those effects must have occurred very rapidly and then endured throughout the remainder of the campaign, from 1999 through 2004. However, rapid changes in youth drug use were not observed in MTF data; rather, the overall trend in MTF past year drug use was flat between 1998 and 1999. Second, rapidly occurring effects were not expected by ONDCP in designing the campaign. As we reported in 2000, and as ONDCP wrote in 2001, ONDCP believed that it would take

2 to 3 years for changes in drug use to be evident as a result of the campaign.[17]

Another campaign design factor that affected Westat's evaluation was the implementation of new campaign initiatives, such as the Marijuana Initiative, which were implemented at times that officials at ONDCP considered to be important, and therefore they may not have coincided with planned data collection for the evaluation, nor should they necessarily have done so. For example, the Marijuana Initiative was implemented in October 2002, and the NSPY data available to evaluate outcomes during it were limited to three complete survey waves. For its longitudinal analysis of change during the Marijuana Initiative, Westat was limited to data from two survey waves. Despite these limitations, the evaluation produced data that enabled Westat to detect effects during the period of the Marijuana Initiative.

Sample Coverage Issues Did Not Invalidate Westat's Assessment of the Effectiveness of Exposure to the Campaign on Intermediate and Drug Use Outcomes

During the enrollment phase of the NSPY, Westat experienced sample coverage problems, in that it enrolled—or rostered—a smaller percentage of households with youth in the targeted age range than would be expected based on comparable Current Population Survey (CPS) estimates—the data that Westat used to develop its expectations about the percentage of households having youth in the targeted age ranges. Coverage refers to the extent to which a sample is representative of the intended population on specified characteristics, and it is important because the omission of segments of the intended population from a sample—or undercoverage—can lead to biased results, in that omitted segments may differ in some important respect from those segments included. Westat estimated the extent of undercoverage in the NSPY to be about 30 percent as compared to the CPS estimates, and according to Westat and NIDA, the undercoverage arose during the stage of sampling in which Westat was developing rosters of households that were believed to contain youth in the target age range. At this stage, the survey rostering process required entry into the household, which may have led respondents in potentially eligible households to refuse to participate.

Our review of Westat's documentation leads us to conclude that there was no evidence of biased results due to undercoverage and that the sample was sufficiently reliable both for the purposes of estimating changes over

[17]GAO/GGD/HEHS-00-153, (Washington, D.C.: July 31, 2000), p. 68.

time in individual outcomes and for assessing the effectiveness of exposure to the campaign on outcomes. Westat's comparisons of the estimated population characteristics of the NSPY—such as race and ethnicity of head of household and race and ethnicity of youth in households—with the estimated population characteristics from the CPS show that they are generally similar. That is, the distributions of characteristics of eligible households with youth included in the NSPY were broadly consistent with a variety of corresponding distributions from the 1999 CPS. These comparisons suggest that the NSPY estimated population by race and ethnicity was similar to that of CPS. Westat also used multivariate modeling techniques to develop weighting adjustments, and it developed weights to adjust its sample for nonresponse that were reasonably effective in reducing nonresponse bias.

An additional test for bias in a sample is to compare estimates derived from it with estimates on the same variable derived from another sample. If the NSPY results were biased, then one would expect that estimates derived from it would differ from estimates derived from unbiased samples. For example, if eligible households refused to participate in the NSPY because they contained teens with drug issues and as a result avoided participation at a higher rate than did households containing teens without drug issues, then these higher refusal rates by households containing teens with drug issues would lead to NSPY estimates of the percentage of youth reporting that they used drugs that were lower than those obtained from other, comparable national surveys. According to data provided by NIDA officials and our review of Westat's final report, estimated self-reported drug use rates from the NSPY are comparable to estimates derived from other major surveys of drug use, such as the National Survey on Drug Use and Health. For example, in the NSPY, rates of past-month marijuana use among 12- to 18-year-olds were 7.2 percent in 2000, 8 percent in 2001, 8.9 percent in 2002, and 7.9 percent in 2003. These rates were similar to those reported for 12- to 17-year-olds in the National Survey on Drug Use and Health (NSDUH) of 7.2 percent in 2000, 8 percent in 2001, 8.2 percent in 2002, and 7.9 percent in 2003. If youth with known drug use problems consistently opted out of both the NSPY and the NSDUH—a hypothesis that is not testable with the available data—then the estimates from both the NSPY and the NSDUH of the true prevalence of youth drug use would be biased underestimates.

Sample Attrition across NSPY Interview Rounds Was Sufficiently Low to Allow for Reliable Assessments of the Effect of Campaign Exposure on Outcomes

As the NSPY was a longitudinal survey—in which eligible sample respondents were re-interviewed up to three times after their enrollment interviews—attrition was a concern with which Westat had to contend. If comparatively large numbers of sample respondents were not retained across successive rounds of the survey, the capacity of the NSPY to provide data to assess changes in outcomes in response to exposure over time would be greatly diminished. Further, if attrition was specific to certain groups, then the NSPY estimates would also be biased.

For the purpose of estimating within-respondent changes in outcomes in response to changes in exposure across sample periods—the main use of the NSPY data—Westat achieved follow-up longitudinal response rates of between 82 percent and 94 percent for waves 4 through 9, the follow-up waves to the first three enrollment waves. The longitudinal response rate consists of two elements: (1) the percentage of prior survey respondents that are tracked and for whom eligibility is determined and (2) the percentage of those eligible that actually complete an interview. Across the three follow-up survey rounds, Westat tracked and determined the eligibility to participate in a follow-up survey of between 92 percent and 96 percent of the youth and parents who completed a survey in the prior round. Of these, Westat obtained consent and completed extended interviews with between 94 percent and 96 percent of youth and parents for whom eligibility for a follow-up survey had been determined.

In our view, Westat's follow-up response rates resulted in a sample that was sufficient to provide reliable findings about the effects of exposure on outcomes. In addition, Westat's nonresponse adjustment methodology compensated for effects of differential response rates related to the percentage of persons in certain age groups, of certain races and ethnicities, of those that owned homes versus rented, those that were U.S. citizens versus noncitizens, and those with incomes below the poverty level.

The NSPY Data Could Be Used to Detect Reasonably Small Effects, and Westat's Measurement of Exposure and Outcomes Were Valid and Could Detect Effects, if They Occurred

The NSPY sample could be used to detect changes in outcomes that were on the order of magnitude of changes expected by ONDCP for the campaign, and its measures of exposure were valid and reliably predicted outcomes. In early meetings on the design of the evaluation of the media campaign, ONDCP officials reported that it had a specific Performance Measures of Effectiveness system and that the campaign was embodied within the first goal of the National Drug Strategy, which was to "educate and enable America's youth to reject illegal drugs as well as the use of alcohol and tobacco." Under this goal, ONDCP's proposed targets for

reducing the prevalence of past-month use of illicit drugs and alcohol among youth from a 1996 base year—by 2002, reduce this prevalence by 20 percent, and by 2007, reduce it by 50 percent. ONDCP officials identified other specific targets, again from the base year 1996—by 2002, increase to 80 percent the proportion of youth who perceive that regular use of illicit drugs, alcohol, and tobacco is harmful; and by 2002, increase to 95 percent the proportion of youth who disapprove of illicit drug, alcohol, and tobacco use. To achieve a goal of 80 percent of 12th grade youth who perceive that regular use of marijuana is harmful would require increasing the 1996 baseline percentage of youth perceiving marijuana as harmful from 60 percent, as measured by MTF, or by about 3.3 percentage points per year from 1996 to 2002. Westat's sample could be used to detect this amount of annual change in youth attitudes.

In order to detect changes in outcomes due to exposure to the campaign, it also was necessary that Westat accurately measure and characterize exposure to the campaign. Westat provided evidence for the validity of its measures of self-reported exposure, and the evidence suggests that the measure of exposure was both valid and reliable. To measure exposure to the campaign for both youth and parents, NSPY interviewers asked respondents about their recall of anti-drug advertisements (general exposure) and their recognition of specific current or very recent television and radio advertisements (specific exposure).[18] To facilitate measures of recall, respondents viewed television and radio advertisements on laptop computers. Youth and parents were only shown or listened only to advertisements targeted to their respective groups. In addition, both youth and parents were asked some general questions about their recall of advertisements seen or heard in various media, including television, radio, newspapers, magazines, movie theaters, billboards, and the Internet.

Westat's assessments of the validity of its measure of exposure to campaign advertisements confirm that the NSPY data were able to measure exposure. First, Westat examined respondents' recall of campaign advertisements using "ringer" television advertisements—advertisements that never had appeared. According to Westat's analysis of ringer advertisements, youth were more likely to recognize an advertisement as a campaign advertisement when presented with an

[18]Each respondent was presented ads that had been broadcast nationally in the 2 calendar months prior to the interview.

actual campaign advertisement than a bogus one. For example, a far lower percentage of respondents (11 percent) claimed to have seen a ringer, or bogus, advertisement than the percentage who claimed to have seen the broadcast advertisements (45 percent), particularly the advertisements that were delivered with high frequency. The result held for youth and for parents.

Second, comparing data on advertisement time purchases with self-reported exposure to these advertisements in the NSPY, Westat found a high correlation between advertising and exposure. Specifically, on the basis of analysis of individual advertisements' gross rating points (GRP)—a measure of the underlying reach and frequency of each advertisement—and self-reported exposures by respondents, Westat found a high correlation between GRPs purchased by the campaign and self-reported exposure to advertisements among youth. The correlation for parents was somewhat smaller, but was also significant. Third, Westat also compared self-reported exposure with recall of the correct brand phrase and found a strong association between self-reported exposure and correct recognition of the brand phrase. This is further evidence for the validity of its measures of self-reported exposure.

Westat measured a variety of outcomes for youth and parents and took steps to ensure that the measures were consistent with existing research. The youth questionnaires included numerous questions that were designed to measure exposure to the campaign advertisements and other anti-drug messages. The youth question areas included exposure propensity to media; current and past use of tobacco, alcohol, marijuana, inhalants, and Ecstasy; past discussions with and communication of anti-drug messages from parents and friends; expectations of others about respondent's drug use; knowledge and beliefs about the positive and negative consequences of drug use; exposure to campaign messages; family and peer factors; personal factors; and demographic information. Westat used separate questionnaires for youth of different ages; one questionnaire was used for children (aged 9 to 11) and another one was used for teens (aged 12 to 18).

Westat's Analytic Methods Aimed to Isolate Causal Effects of the Campaign and Did So Using Sophisticated Techniques That Enhanced the Strength of Its Findings

In it analysis, Westat used three types of evidence to draw inferences about the effects of the campaign: (1) trend data—data that describe increases or decreases in drug use and other outcomes over time; (2) cross-section analysis—measures of association between exposure to campaign messages and individual drug use beliefs, intentions, and behaviors, at the time data were collected; and (3) longitudinal analysis—measures of association, for youth and parents who were observed at two points in time, between exposure to campaign messages at the earlier time on outcomes at the later time.[19] Westat indicated that trends over time, by themselves, could not be used to provide definitive support for campaign effects. Rather, the trends needed to be supported by measures of association. Westat also indicated that measures of association, whether cross-sectional or longitudinal, needed to control for variables that could influence outcomes independently of the campaign or otherwise confound the association between exposure and outcomes. Cross-section association between exposure and outcomes measured at the same time would provide stronger evidence of campaign effects than would trend data alone, provided that controls for other variables were introduced into the associational analyses. However, even if cross-section associations between exposure and outcomes hold after controlling for the effects of other variables, as Westat pointed out, there may remain an alternative explanation for cross-section associations: For example, an outcome—like perceptions of others' use of drugs—may be the cause of exposure rather than an effect of it. Westat's longitudinal analysis attempts to address the ambiguities that exist with cross-sectional associations. With longitudinal data, if, after controlling for other confounding variables, exposure measured at an earlier time is associated with an outcome at a later time, the inference made is that the causal direction is from exposure to outcome, since an effect cannot precede a cause in time.

As the campaign was implemented nationally and it was therefore not possible to assign youth and their parents randomly to treatment and control groups, a major threat to the validity of the conclusions from the evaluation is that the observed correlations between exposure to the campaign and self-reported attitudes and behaviors could reflect preexisting differences among individuals in their underlying susceptibility to campaign messages. The evaluation's associations between exposure to the campaign and self-reported initiation of marijuana use took into account statistically the individual differences in attributes among youth

[19]Westat also called its longitudinal analysis a "delayed effects" analysis.

who were exposed to various levels of campaign messages, and they adjusted for the influence of other variables that could determine marijuana initiation—called confounder variables. As such, Westat's evaluation of the associations between campaign exposure and marijuana initiation have accounted for individual differences among youth and can be viewed as comparisons of outcomes for statistically similar individuals. Further, the statistical test Westat used in assessing the relationship between exposure and initiation did not rely upon assumptions of linearity between levels of exposure and initiation. Instead, it tests for an ordered relationship between exposure and an outcome such as marijuana use initiation.

Westat used statistical methods to address the possibility that preexisting differences between individuals could have caused both reported levels of exposure and respondent outcomes, and its use of these methods contributed to the validity of its findings about the effects of the campaign on outcomes. If, independently of the campaign, individuals differed in their underlying tendencies to accept and recall campaign messages, and if the individuals who were more likely to recall advertisements also were those who were more likely to respond to advertisements, then, absent efforts to address this confounding factor, the findings about the evaluation would be questionable. This type of bias is often called a selection effect. If selection effects occurred in the campaign, then both exposure and reported changes in attitudes and behaviors could reflect underlying beliefs that were not affected by the campaign, despite the presence of statistical correlations between self-reported exposure and changes in attitudes and behaviors.

To control for selection effects and the many factors that could have influenced both exposure and outcomes independently of, or in conjunction with, the campaign, Westat used propensity scoring methods. These methods limit the influence of preexisting differences among exposed groups by controlling for a wide range of possible confounding variables. Propensity score methods are used to create comparison groups that are similar on measured and potentially confounding variables but that differ on their levels of treatment. In the evaluation of the campaign, the comparison groups were similar on confounding variables but differed on their level of exposure to campaign messages. Propensity score methods replace a set of confounding variables with a single function of these variables, which is called the propensity score. In Westat's analysis, an individual's propensity score is considered to represent an individual's probability of being assigned to a particular level of exposure to the campaign, conditional upon the individual's values of the confounding

variables. By including relevant, potentially confounding variables and matching individuals on their propensity scores, Westat was able to minimize bias due to selection effects. The comparison groups that Westat created by using propensity score methods can be considered as statistical analogues to randomly assigning individuals to different levels of exposure. After creating these groups, Westat then analyzed outcomes among the groups having different propensities to be exposed to campaign messages.

Our assessment of Westat's methods leads us to conclude that Westat took reasonable steps to develop valid propensity models, and as a result of its models, its analysis identified the effects of the campaign, net of other factors included in its propensity score models. First, rather than simply compare individuals who were exposed to campaign messages with those who were not exposed, Westat estimated and compared groups of individuals with different levels of exposure, where the number of exposure groups was measured alternatively as a three- or four-level variable—e.g., low, medium, or high exposure.[20] Second, for the results of propensity methods to be valid, it is important that the propensity scoring models include all relevant variables that could otherwise explain differences in both exposure and outcomes, as evaluators can adjust only for confounding variables that are observed and measured. If an important variable is omitted from the propensity model, the results of analyses may be affected. Westat's models included many relevant and potentially confounding variables. For example, in the youth models, the propensity score models included measures of demographic attributes, educational attainment and educational aspiration, family and parent background, parental consumption of television and other media, income and employment, reading habits, Internet usage, location of residence in an urban area, among other variables. Third, for propensity models to remove the effects of confounding variables from the association between exposure and response, it is necessary that the population means of the confounder variables not vary across exposure levels. If a confounder is successfully balanced, then it will have the same theoretical effect across all exposure levels. After estimating models, Westat also assessed and demonstrated the balance of variables in its propensity models.

[20]Propensity score methods have been demonstrated to be robust against bias associated with the specification of incorrect functional forms—e.g., linear rather than quadratic—of variables.

The Phase III Evaluation Provided Mixed Evidence of the Campaign's Effectiveness on Intermediate Outcomes, but It Found No Effect of the Campaign on Parental Monitoring of Youth

Westat reported mixed evidence about the effectiveness of the campaign on intermediate outcome measures—such as recall and identification of campaign messages, youth anti-drug attitudes, and parents' beliefs and behaviors—that were thought to be causal factors influencing youth drug use, the ultimate target of the campaign. Most parents and youth recalled exposure to campaign anti-drug messages, and for both groups, recall increased during the September 1999 to June 2004 period covered by the phase III evaluation. For current, non-drug-using youth—whose resistance to initiating marijuana use the campaign intended to affect—although NSPY data showed some favorable trends in anti-drug attitudes and beliefs and in the proportion of youth who said that they would definitely not try marijuana, there was no evidence that exposure to the campaign influenced these trends. Conversely, among current, non-drug-using youth, evidence suggested that exposure to the campaign had unfavorable effects on their anti-drug norms and perceptions of other youths' use of marijuana—that is, greater exposure to the campaign was associated with weaker anti-drug norms and increases in the perceptions that others use marijuana. On three of five parent belief and behavior outcome measures—including talking with children about drugs, doing fun activities with children, and beliefs about talking with children—the evidence pointed to a favorable campaign effect on parents. However, while there was mixed evidence on the effect of the campaign on parents' beliefs and attitudes about monitoring children's behaviors, there was no evidence to support a claim that the campaign actually affected parents' monitoring behaviors—an area of the campaign's focus for parents—and there was little evidence for favorable indirect effects on youth behavior or beliefs as the result of parental exposure to the campaign.

Youth and Parents' Recall of Campaign Advertisements Increased over Time, Their Impressions of the Advertisements Were Favorable, and They Could Identify the Campaign Brand

According to Westat, the campaign purchased enough advertising time over the 58-month period from September 1999 to June 2004 to achieve an average exposure of 2.5 youth-targeted ads per week for youth and an average of 2.2 parent-targeted advertisements per week for parents. Westat's estimates include campaign advertisements intended for either all youth or all parents, but they do not include exposure of youth to parent advertisements or parents to youth advertisements, nor do they account for separate advertising targeted to specific race- or ethnicity-defined audiences.

Using exposure indexes, Westat measured trends in general and specific exposure to campaign advertisements. The general exposure index was based on questions that asked about exposure to anti-drug messages in recent months through a variety of channels, including movies, television,

radio, and billboards, and was not limited to campaign advertisements.[21] The specific exposure index was based on recall of specific advertisements broadcast during the 60 days prior to the respondent's interview, and was limited to advertisements that targeted the respondent. For example, for youth, only youth advertisements were sampled to measure specific exposure. Youth aged 12½ to 18 and their parents reported increasing levels of recall of specific but not general exposure to campaign advertisements over time. For both parents and youth, there was a sharp increase over time in the recall of specific exposure of television ads across the campaign. Westat speculated that the increase in specific recall may have arisen from better-placed, more memorable, or longer-aired advertisements rather than only to an overall increase in television advertisements. However, recall of all general anti-drug advertising was fairly stable over time, as there was no overall detectable change in reported general exposure over the course of the campaign.

Beginning in 2001, when the evaluation started to measure brand phrase recall, and continuing through 2004, the evidence indicates that youth, in particular, exhibited increases in brand phrase recall. Advertising campaigns may use a brand phrase to provide a recognizable element, and to the extent that the brand is recognized and positively regarded, its familiarity may lead to a positive response to a new advertisement or increase the perception that each advertisement is part of a larger campaign. The campaign included both a parent and a youth brand. Brand messages may have involved a series of phrases or the portrayal of an activity or lifestyle as positive (e.g., participating in team sports) to set up the brand phrase of "The Anti-Drug." Westat reported that the evidence from the NSPY shows that the greater the exposure to media campaign advertising, the more likely respondents were to recall the brand phrase. In addition, the more that respondents recalled specific ads, the more likely they were to recognize the brand phrase, although over time even those with less exposure had learned the brand phrase.

Overall, youth reported favorable impressions of the subset of campaign television advertisements that they were asked to evaluate, and their favorable impressions increased over time. Responses to the advertisements—whether they were attention getting, convincing, or said

[21]According to Westat, the reference period for the general exposure index, is "in recent months," and this wording was chosen to maintain equivalence to the wording used in the Monitoring the Future surveys in its questions about anti-drug advertising.

something important to the respondent—were positive among both youth and their parents. Parents' evaluations of the advertisements were generally more positive than those of youth, and parents' positive views also increased over time.

In addition to distributing messages directly in media advertisements, the campaign aimed to reach its target audiences indirectly through other institutions and routes, such as community groups, in-school and out-of-school anti-drug education, and discussions among youth and parents, and youth and friends, concerning drug use and the drug advertisements. The NSPY data indicated that the campaign's messages were not accompanied by similar increases in exposure to messages from other sources. Both youth and parents reported receiving anti-drug messages from other sources, but they did not consistently report increases in exposure to messages from these sources. For example, from the 2000 to 2004 samples, the percentages of youth reporting receiving in-school drug education messages and attending out-of-school drug education both declined.

Westat Found That the Campaign Generally Had No Effect on the Attitudes of Youth Not Using Marijuana toward Its Use but That Exposure to the Campaign Was Associated with Unfavorable Effects on Youth Perceptions of Others' Use of Marijuana

Westat generally found no significant effects of campaign exposure on the cognitive outcomes of adolescent nonusers of marijuana—i.e., development of anti-drug attitudes and beliefs. For current nonusers, the evaluation reported on four cognitive measures and a fifth measure of their perceptions of others' use of marijuana. Three of the four measures—attitudes and beliefs about the consequences of marijuana use; perceived social norms or pressures from parents, friends, and peers about infrequent or regular marijuana use; and perceived self-efficacy to avoid using marijuana, or their confidence to turn down use of marijuana under various circumstances—were premised to affect the fourth—youth intentions to use marijuana at all during the next year. The fifth outcome, perceptions of other youths' use of marijuana,[22] was included to examine whether exposure to the campaign was leading to increased perception among youth that others use marijuana, and whether this perception, in turn, affected their own behaviors.

Westat reported that the evidence from the analysis of trend data from 2000 to 2004 for two of the youth cognitive measures—attitudes and beliefs about the consequences of marijuana use and intentions to use marijuana—showed significant increases in youth believing that marijuana

[22]This was measured as the "Percent perceiving few other kids regularly use marijuana."

use had negative consequences and significant increases in the percentage of youth that reported that they had no intention to use marijuana. However, evidence from both cross-section and longitudinal associations between exposure and these two cognitive outcomes did not substantiate that the favorable trends arose from exposure to the campaign. Specifically, the cross-sectional associations between both general and specific exposure to the campaign and intentions not to use marijuana show no significant favorable effects of exposure on this outcome. None of the cross-section associations between either general or specific exposure and intention to use marijuana are significant, and none of the longitudinal associations between specific exposure and intentions are significant. Two of the longitudinal associations between general exposure and intentions are significant, but the direction of the effect is unfavorable, in that greater exposure led to declines in intentions not to use marijuana. The evidence from the associational analyses between exposure and attitudes and beliefs about the consequences of marijuana use generally did not show an effect of the campaign. While there was one significant cross-section association between general exposure and attitudes and beliefs about consequences during the final two waves of survey data, there were no significant cross-section associations between specific exposure and attitudes and beliefs about consequences, nor were there any significant longitudinal associations with either general or specific exposure.

The associational analysis also produced some evidence of unfavorable effects of exposure on social norms—i.e., social pressures from parents, peers, and other important persons about marijuana use. Westat's cross-section associations showed no significant effects of exposure on social norms, but its longitudinal associations showed that across all survey rounds, there was a significant relationship between specific exposure and weaker social norms. Westat's analysis of associations between exposure and perceptions of others' use of marijuana also produced significant results. Cross-section associations between specific exposure and perceptions of others' use were significant, as were longitudinal associations of this relationship. In other words, among youth who reportedly did not use marijuana at the time of their interview, there was a significant effect of specific exposure on the perception that others used marijuana, and the direction of the effect was unfavorable—that is, those reporting higher exposure to anti-drug ads were more likely to believe that their peers used marijuana regularly. A significant and unfavorable relationship between specific exposure and perceptions of others' use of marijuana was obtained for the data covering the entire period of the

evaluation as well as for the period of the redirected campaign, from 2002 to 2004.

The Evaluation Reported Favorable Effects of the Campaign on Three Parent Outcomes but Not on Parental Monitoring

A theme of the campaign was to encourage parents to engage with their children to protect them against the risk of drug use, and parent skills were a focus of parent advertising almost since the start of the campaign. The campaign encouraged parents to monitor their children's behavior by knowing where they were and with whom, and to make sure that they had adult supervision. It also encouraged parents to talk with their children about drugs and to a lesser degree to engage in fun activities with their children. The evaluation observed five outcomes for parents, and for four of the five found significant and favorable effects of exposure to the campaign. For three outcomes—parent-child conversations about drugs (talking behavior), parents' beliefs and attitudes about talking with their children about drugs (talking beliefs), and parents' engagement with their children in in-home and out-of-home activities (fun activities)—both cross-section and longitudinal associations between exposure and outcomes were generally significant and favorable to the campaign. For parents' beliefs and attitudes toward monitoring their children's behaviors, Westat reported favorable trend and cross-sectional associations but no significant overall longitudinal effects of either general or specific exposure on this outcome. For the fifth outcome, parent monitoring behaviors—that is, parents' knowing or having a pretty good idea about what their child was doing or planned to do—the evidence did not support a finding of an effect of the campaign. There were no significant favorable trends in parents' reports of monitoring behaviors, and there were no significant cross-section or longitudinal associations of either general or specific exposure on monitoring behaviors.

No Evidence of Favorable Effects of the Campaign on Youth Outcomes through Campaign Effects on Parental Outcomes

Despite evidence of some favorable parental outcomes for the campaign, Westat found no significant evidence for the overall evaluation that these favorable parent outcomes affected youth attitudes and behaviors toward drug use. Specifically, for the entire period covered by the evaluation, Westat found no evidence of overall, indirect campaign effects on parents leading to changes in marijuana use, intentions to use marijuana, social norms, self-efficacy, or cognitions among youth who were not marijuana users. Westat found that there were some significant indirect effects of parental specific exposure on some youth outcomes for some subgroups. For example, parental specific exposure was favorably associated with intentions to use marijuana for 14- to 18-year-olds and for boys, and it was also associated favorably with attitudes and beliefs about the

consequences of marijuana use for Hispanics. Westat also found significant but unfavorable indirect effects of parents' general exposure on subgroups of youth in other youth outcomes. For example, parental general exposure was unfavorably associated with youth social norms for 14- to 16-year-olds and for girls.

The Phase III Evaluation Found No Significant Effects of Exposure to the Campaign on Youth Drug Use Outcomes Other than Limited Unfavorable Effects on Marijuana Initiation

Westat reported that the NSPY data showed some declines in self-reported lifetime and past-month use of marijuana by youth over the period from 2002 to 2004, and these trends in NSPY were consistent with trends in other national surveys of drug use over these years. Westat also reported that the NSPY data showed declining trends in youth reports of offers to use marijuana. However, Westat cautioned that because trends do not account for the relationship between campaign exposure and changes in self-reported drug use, drug use trends alone should not be taken as definitive evidence that the campaign was responsible for the declines. On the basis of the analysis of the relationship between exposure to campaign advertisements and youth self-reported drug use in the NSPY data—assessments that used statistical methods to adjust for individual differences and control for other factors that could explain changes in self-reported drug use—for the entire period covered by its evaluation, Westat found no significant[23] effects of exposure to the campaign on initiation of marijuana by prior nonusing youth. The only significant effect indicated in Westat's analysis of the relationship between campaign exposure and self-reported drug use was an unfavorable effect of exposure on marijuana initiation—that is a relationship between campaign exposure and higher rates of initiation—for one round of NSPY data and similar unfavorable effects of campaign exposure on marijuana initiation among certain subgroups of the sample (e.g., 12½- to 13-year-olds and girls). Westat found no effects of campaign exposure on rates of quitting or use by prior users of marijuana.

[23]In discussing Westat's findings, any references to significance refers to statistical significance.

Westat Tracked Trends in Marijuana Use from Several Sources and Reported That the Trend Data by Themselves Were Insufficient to Demonstrate Effects of Exposure to the Campaign

Westat tracked trends in self-reported use of marijuana by youth and trends in youth reports of offers to use marijuana for the period from 2000 to the first half of 2004 to determine if there were significant declines. Westat also assessed these trend data for changes occurring since 2002, or during the period of the redirected campaign. Westat's trend analysis was designed to provide supportive but not definitive evidence for campaign effects.

In its trend analysis, Westat compared trends in self-reported drug use—lifetime, past year, and past month—in the NSPY with trend data on self-reported drug use from three other nationally representative surveys of drug use—Monitoring the Future, the Youth Risk Behavior Surveillance System (YRBSS), and the National Survey on Drug Use and Health.[24] Both MTF and YRBSS are school-based surveys, and NSDUH is a household survey that provides estimates of drug use by the civilian, noninstitutionalized population of the United States aged 12 years and older. Methodological differences between the school-based surveys—MTF and YRBSS—and the household surveys—NSPY and NSDUH—have been shown to account for the some of the differences in estimates of marijuana use.

According to Westat's analysis, the surveys of self-reported marijuana use show some similarities and differences in trends depending upon the measure, age group, or subperiod covered within the longer 2000 to 2004 period. For example, the MTF data generally show declines in lifetime, past-year, and past-month self-reported drug use for 8th, 10th, and 12th graders over the years from 2000 to 2004, although only some of the year-to-year differences in the MTF self-reported drug use data were statistically significant. Nonetheless, for the subperiod from 2002 to 2004, MTF data show statistically significant declines in past-year and past-month use for 8th graders and past-year use for 10th graders, and the NSPY data also show statistically significant declines in past-month use from 2002 to 2004 for youth aged 12½ to 18 years old and for 14- to 18-year-olds. On the other hand, the MTF data suggest a decline in past-year and past-month use by 10th graders from 2000 to 2002, but the NSPY data suggest an increase in past-month marijuana use during this period.[25] Further, the data from NSDUH for 2000 and 2001 also show statistically

[24]This survey was formerly known as the National Household Survey on Drug Abuse.

[25]Westat points out, however that the MTF decline in use among 10th graders between 2001 and 2002 was within the statistical confidence limits of NSPY.

significant increases in lifetime, past-year, and past-month marijuana use among youth aged 12 to 17, statistically significant increases in lifetime and past-year marijuana use for youth aged 16 to 17, and a statistically significant increase in past year use for youth aged 14 to 15. The pattern of increase in NSDUH data from 2000 to 2001 is consistent with the 2000 to 2002 increases in past-month use in NSPY, but they differ from the MTF trends over this period.

All four surveys generally show declines in marijuana use beginning in 2002, but not all of the declines are statistically significant. Both MTF and NSPY show some statistically significant declines since 2002, and while NSDUH and YRBSS show declines, the declines were not statistically significant. These declines starting in 2002 coincide with the redirected campaign and the introduction of the Marijuana Initiative.

Despite the concurrence of the trend data from all sources for the 2002 to 2004 period, Westat concluded that the existence of declining trends in self-reported drug use by themselves do not provide definitive evidence that the campaign caused the declines because factors other than the campaign also could affect behavior. For example, changes in high-school completion rates among youth could affect drug use behaviors, as high school dropouts may have more involvement with drugs than youth who stay in school. Additionally, declines in self-reported drug use that began before the initiation of phase III of the campaign could not have been caused by the campaign. The declines reported in MTF began prior to the start of phase III of the campaign; therefore, factors other than the campaign had to have been responsible for the start of the decline occurring in these data. Further, ONDCP also has acknowledged the limitations of trends in the national surveys for determining whether changes in drug use were the result of the campaign. ONDCP's Office of Programs, Budget, Research and Evaluation wrote about the MTF, YRBSS, and NSDUH:[26]

> "They provide policy makers with broad indicators of the success of policy…However, they will not be able to answer the critical question of whether these changes were the result of the Media Campaign. These surveys do not ask

[26]At the time that ONDCP prepared this document, NSDUH was still known as the National Household Survey on Drug Abuse, or NHSDA.

respondents about their exposure and reactions to the messages of the Media Campaign that can then be linked to their drug-related attitudes and behavior."[27]

Westat Reported That Trends in Marijuana Offers Declined over Time, but Factors Other than the Campaign Contributed to Changes in Offers

Westat assessed trends in youth reports of receiving offers of marijuana—whether anyone had ever offered youth marijuana and the frequency of offers within the past 30 days. Marijuana offers are closely related to marijuana use, and the campaign aired messages that encouraged resistance to offers of marijuana. Over the 2000 to 2004 period, Westat found significant increases in the percentage of youth reporting that they had never received offers, and it also found significant decreases in the percentage of youth reporting that they had received offers in the prior month. Westat also found significant changes in offers over 2002 to 2004, during the period of the redirected campaign, and these changes were generally consistent with the trends for the overall 2000 to 2004 period. Further, on the basis of longitudinal analysis of the relationship between offers in one period and marijuana use in the subsequent period among youth who were nonusers in an initial survey round—an analysis that assesses whether offers precede use or are simply a correlate of it—Westat found that youth who reported having received a marijuana offer at one period were much more likely—between three and seven times more likely, depending upon age group—to have initiated marijuana use at a following period than nonusing youth who reported never having received such an offer. However, as Westat reported, while the findings on offers are favorable, they cannot be ascribed to the campaign because they may be caused by other factors, as the analysis of the relationship between offers and use did not take into account other factors that could affect use.

[27]Office of Programs, Budget, Research and Evaluation, Office of National Drug Control Policy, "Youth Drug Use and the National Youth Anti-Drug Media Campaign," February, 2001 (Washington, D.C.: Executive Office of the President), p. 16.

On the Basis of Its Analysis of the Association between Exposure and Drug Use Outcomes, Westat Found No Evidence That Exposure to the Campaign Affected Initiation or Cessation of Marijuana Use

From its longitudinal analysis of associations between exposure and initiation of marijuana use, Westat found no evidence that increased exposure to the campaign reduced youth's initiation of marijuana use. Westat's longitudinal analysis assessed the effects of exposure at one survey wave on marijuana initiation at a subsequent survey wave, controlling for potential confounding variables that could affect the exposure initiation relationship. Westat assessed the effects of two types of exposure on initiation of marijuana use—general exposure and specific exposure. General exposure represents the sum of recalled exposure to anti-marijuana advertising in four types of sources of advertisements—television and radio, movies and videos, print media including newspapers and magazines, and outdoor media. Specific exposure represents the sum of recalled exposure to youth-targeted individual campaign television advertisements that had been aired in the 60 days prior to an interview.

Westat found no significant effects of the level of general exposure on marijuana use initiation, either over the entire period of the campaign or between subperiods as defined by survey rounds.[28] Westat also found no overall effects of levels of specific exposure on marijuana initiation during the entire period of the campaign, but it found one significant association between specific exposure and marijuana use initiation that occurred in the data from wave 7 and its wave 9 follow-up, or during the period of the Marijuana Initiative. Wave 7 was the first complete survey wave covering exposure to the Marijuana Initiative. The significant association from this analysis was that higher levels of specific exposure were associated with higher levels of initiation of marijuana use among previously nonusing youth.

Westat also examined the longitudinal relationships between exposure and initiation for nine subgroups of youth (two sexes, three race/ethnicity groups, two risk groups, and two nonoverlapping age groups). For several subgroups, it found significant associations between specific exposure and marijuana initiation. These associations were in a direction that was unfavorable to the campaign, in that greater specific exposure was associated with higher levels of initiation. The subgroups for which these unfavorable associations were most pronounced included 12½- to 13-year-olds, girls, African Americans, and lower risk youth.

[28]Westat's assessed the exposure-initiation relationship using data from survey rounds 1 and 2, survey rounds 2 and 3, and within survey round 4; it assessed the exposure-initiation relationship between waves 6 and 8 and waves 7 and 9.

On cessation and reduction of marijuana use, Westat assessed two outcomes among current marijuana users: the rate at which they quit using marijuana and their frequency of use. The frequency of use measure allowed for campaign effects to be observed if users did not quit but reduced their use of marijuana. Westat estimated that the quit rate—the percentage of prior-year users reporting that they no longer used marijuana—among prior-year users of marijuana was 24.8 percent. However, it found no statistically significant association between general exposure and quitting or between specific exposure and quitting. It also found that among adolescent marijuana users, the frequency of use—increase, decrease, or no change—was not affected by exposure to the campaign.

Conclusions

A well-designed and executed multiyear study of the impact of the ONDCP anti-drug media campaign on teen initiation of drug use, or cessation of drug use, shows disappointing results for the campaign. The study provides no evidence that the campaign had a positive effect in relation to teen drug use, and shows some indications of a negative impact. Some intermediate outcomes, such as parents talking with children about drugs, and doing fun activities with their children, showed positive results in that the media campaign encouraged parents to adopt these behaviors. However, other intermediate outcomes, such as parents' monitoring of their children's behavior, were not shown to be affected by the campaign. Moreover, the evaluation did not provide evidence that intermediate outcomes that showed positive results translated into greater resistance to drugs among the teenage target population.

Unfavorable preliminary findings from the evaluation were reported by Westat in 2002. Beginning in 2002, ONDCP took a number of steps that were intended to strengthen the power of the campaign to achieve positive results. These steps included more rigorous ad copy testing and a concentration on anti-marijuana messages. However, the post-2002 results yielded no evidence of positive impacts and some evidence of negative and unintended consequences in relation to marijuana use. Specifically, exposure to advertisements during the redirected campaign was associated with higher rates of marijuana use initiation among youth who were prior nonusers of marijuana.

Most parents and youth recalled exposure to the campaign messages and, further, they recognized the campaign brand. Thus, the failure of the campaign to show positive results cannot be attributed to a lack of recognition of the messages themselves. This raises concerns about the

ability of messages such as these to be able to influence teen drug attitudes and behaviors. It raises questions concerning the understanding of the factors that are most salient to teens' decision making about drugs and how they can be used to foster anti-drug decisions.

Westat's evaluation is centered on this particular configuration of a media campaign as it was presented from 1999 to 2004, and its results pertained to the campaign nationwide. It cannot be construed to mean that a media campaign that is configured differently from this one cannot work. Nor should its results be construed to mean that in some locations, for some groups of youth, the campaign did not have an effect on drug use. However, substantial effort and expertise were brought to the task of designing the advertisements from the outset, and the 2002 redirection of the campaign placed even greater emphasis on copy testing and enhanced ONDCP oversight. This casts some doubt on the notion that a better media campaign can lead to positive results.

It is also important to note that two recent smaller studies in three locations have provided evidence of a limited effect of the campaign for some youth, and it is quite possible that additional analyses of the NSPY data using different methods or measures may find other effects of the campaign, at least for some adolescents, than have been produced by Westat's evaluation team. The data from the evaluation have only recently been made available to academic and other researchers, and while the analyses undertaken by Westat are, as we have noted elsewhere, appropriate and thorough, they are not exhaustive.

It is heartening that surveys intended to measure teen drug use, such as Monitoring the Future, are showing declines in marijuana use in recent years. Indeed, NPSY also shows some evidence of a decline in drug use among teens. However, Monitoring the Future and other surveys of teens concerning drug use are not linked to exposure to the media campaign, and NPSY shows no relationship between anti-drug media campaign exposure and favorable drug outcomes for teens. This seems to indicate that other unidentified factors, other than the anti-drug media campaign, are affecting drug use decisions among teens.

Although ONDCP has pointed to declines in teen drug use and credited the campaign along with other prevention efforts as contributing to significant success in reducing teen drug use, trend data derived from the Monitoring the Future survey that show declines in teen marijuana use from 2001 to 2005 do not explicitly take into account exposure to the campaign, and therefore, by themselves, cannot be used as evidence of effectiveness.

ONDCP has indicated in the past, and we concur, that because these surveys cannot link their results with the media campaign, they do not measure campaign effectiveness. The evaluation of the media campaign reinforces the lack of linkage between the media campaign and teen drug use behavior.

It is important to note that virtually all social science research is imperfect. Attempting to systematically observe and document human behavior in real-world settings is a daunting task given the extremely wide variation in both humans and settings. We believe that the evaluation of the ONDCP media campaign is credible in that it was well designed given the circumstance of the campaign, and appropriately executed.

Matter for Congressional Consideration

In light of the fact that the phase III evaluation of the media campaign yielded no evidence of a positive outcome in relation to teen drug use and congressional conferees' indications of their intentions to rely on the Westat study, Congress should consider limiting appropriations for the National Youth Anti-Drug Media Campaign beginning in the fiscal 2007 budget year until ONDCP is able to provide credible evidence of the effectiveness of exposure to the campaign on youth drug use outcomes or provide other credible options for a media campaign approach. In this regard we believe that an independent evaluation of the new campaign should be considered as a means to help inform both ONDCP and Congressional decision making.

Agency Comments and Our Evaluation

We provided a draft of this report to the Director of the Office of National Drug Control Policy for comment on July 31, 2006. ONDCP provided us with written technical comments on the report, which we incorporated where appropriate. In addition, ONDCP provided written comments about our report in which it raised a question about our matter for congressional consideration and outlined a number of concerns that it had with our report on Westat's findings. These written comments are reproduced in appendix II. In our evaluation of ONDCP's written comments, we address each of the other concerns in the order ONDCP presented them.

Westat Evaluation's Role in Judging the Impact of the Advertising Campaign

ONDCP comments that Westat's evaluation is ill suited to judge the impact of an advertising campaign in part because Westat attempted to establish a causal relationship between exposure and outcomes, and this, ONDCP indicates, is something that major marketers rarely attempt because of its difficulty. ONDCP writes, "we take issue with the fundamental method

pursued by Westat and GAO, and therefore, believe that the study's findings are deeply flawed." We find this response surprising for a number of reasons. First, ONDCP is on record as stating that the evaluation conducted by Westat would be the means to assess the impact of the campaign. Indeed, in February, 2001, in the ONDCP publication entitled *Youth Drug Use and the National Youth Anti-Drug Media Campaign*, ONDCP states:

> "ONDCP, on the other hand, is measuring the impact of the Media Campaign with a thorough, rigorous, and independent evaluation. The nationally representative evaluation is being conducted for ONDCP by the National Institute on Drug Abuse (NIDA).…The evaluation is a 4-year longitudinal study of parents' and their children's exposure and response to the Media Campaign.…ONDCP will be able to assess the extent to which changes in anti-drug attitudes and beliefs or drug using behavior can be attributed to the Media Campaign."[29]

ONDCP officials had opportunities during the evaluation to raise concerns about Westat's design and its efforts to establish a link between exposure to the campaign and outcomes, but we are not aware of their having done so. However, we are aware of ONDCP's participation in a NIDA-sponsored expert panel review of Westat's evaluation that was held in August 2002. Our review of the minutes of that meeting reveals that while an ONDCP official raised concerns about issues such as assessing the nonadvertising components of the campaign and the number of interim reports, ONDCP officials did not at that time raise concerns that the evaluation was fundamentally flawed. The consensus of the expert panel was that Westat's evaluation was "pretty impressive" given the challenges presented by the absence of baseline data and of an experimental design. Panel members also asserted that Westat's use of propensity score models to isolate the effects of the campaign was termed both "sensible" and "state-of-the-art."

ONDCP further states that major advertisers evaluate the success of their campaigns by rigorously testing advertisements prior to airing and by developing correlations between messages and consumer attitudes and behavior. While we do not dispute whether this is a commonly used approach among major advertisers, we believe that in assessing the

[29]Office of Programs, Budget, Research and Evaluation, Office of National Drug Control Policy, "Youth Drug Use and the National Youth Anti-Drug Media Campaign," February, 2001 (Washington, D.C.: Executive Office of the President), p. 3.

expenditure of public funds researchers should attempt, where feasible, to establish causal relationships or use research designs that attempt to isolate the effects of federally funded interventions. While we acknowledge that establishing causal relationships is difficult, we maintain that Westat used sophisticated and appropriate statistical methods that aimed to isolate the effects of recalled exposure to the campaign on youth drug use. Further, adopting a methodology that relies upon correlations between advertising messages and an outcome, such as reductions in youth drug use, without attempting to take into account many of the other factors that could affect drug use allows for too many post hoc explanations of findings. Westat's analysis included socioeconomic factors, parent characteristics, television viewing habits, risk of using drugs, and sensation-seeking tendencies to be able to determine whether exposure was related to drug use net of the influences of these factors. We conclude, on the basis of our assessment of Westat's methods, that exposure to campaign messages generally did not influence youth drug use net of these other influences.

ONDCP notes that correlational findings have been used to assess anti-tobacco advertising campaign results. We have not reviewed the anti-tobacco campaign and cannot comment on its relationship to youth smoking prevalence. We notice, however, that in ONDCP's comments on "Consequences of Further Budget Cuts," it appears to contradict its statements about establishing causal relationships to determine the effect of advertising campaigns. ONDCP writes, "Previous studies have established a relationship between exposure to anti-tobacco messages and smoking rates among teens." ONDCP goes on to draw an analogy between anti-smoking messages and anti-drug messages to write, "We should expect similar results for illicit drug use if anti-drug messages decline." These statements emphasize very directly the same kind of causal relationships that ONDCP cites as not appropriate in its opening comments.

We also note that ONDCP indicates in its comments that it has made multiple refinements to the media campaign on the basis of earlier findings from the Westat study. This seems to be inconsistent with a position of major concerns with the fundamental soundness of the study.

Finally, the three research papers that ONDCP cites on page 2 of its comments on "Conflicting Evidence from Other Research" all use exposure-response methodologies that are analogous to Westat's and all attempt to isolate the causal effects of exposure either to ONDCP's campaign or to other media campaigns. Thus, it would seem that ONDCP's

comment that efforts to isolate causal effects of media campaigns are fundamentally flawed would also apply to these three studies.

ONDCP Made Campaign Changes as a Result of Westat Interim Findings

ONDCP indicates that it has sought to improve the performance of the media campaign by using the results from the Westat study and other data. We are aware that ONDCP redirected the campaign in 2002 in response to Westat's interim findings that indicated some negative impacts of the campaign on youth marijuana use. However, the 2002 to 2004 Westat study results also did not show positive outcomes. Westat's study is the only national evaluation of the campaign. Although Monitoring the Future provides context regarding general drug trends among youth, as ONDCP has stated:

> "These surveys [MTF, the National Household Survey on Drug Use, and the Youth Risk Behavior Survey] will permit the determination of whether drug use behavior and related attitudes and beliefs changed after the launching of Phase III of the Media Campaign in mid-1999. However, they will not be able to answer the critical question of whether these changes were the result of the Media Campaign. These surveys do not ask respondents about their exposure and reactions to the messages of the Media Campaign that can then be linked to their drug-related attitudes and behavior."[30]

More recently in late 2005, ONDCP launched a newly designed campaign. The impact of this campaign is not known and should be independently evaluated.

Other Youth Drug Use Findings

ONDCP believes we did not provide adequate discussion of studies that report findings contrary to those of Westat. Our report mentions two of the three studies that ONDCP identifies—the Longshore and Palmgreen studies. Our report does not mention the third study, Slater, because it focused on a different anti-drug media campaign approach and not on the ONDCP media campaign. Overall, these studies' findings are not necessarily "contrary" to Westat's findings. Rather, they assess small slices of the youth population or particular circumstances (such as other programs that could reinforce an anti-drug message) and find some positive results. The Westat national findings do not preclude the findings of positive results for some subpopulations of youth. The Palmgreen study,

[30]Office of Programs, Budget, Research and Evaluation, Office of National Drug Control Policy, "Youth Drug Use and the National Youth Anti-Drug Media Campaign," February, 2001 (Washington, D.C.: Executive Office of the President), p. 16.

for example found a positive effect for the media campaign on high-sensation-seeking youth, but did not find an effect on non-high-sensation-seeking youth in the two moderate size communities in which the study was conducted. The distribution of these youth in the nationwide population could be consistent with both studies being correct. Our objective was to assess the Westat study as a national evaluation of the impact of the national campaign. In the Slater study, after being trained in the use of campaign media materials, leaders in each of eight communities that received a media campaign were allowed to develop their own media strategies and were able to use whatever materials they chose or developed on their own. This approach emphasized the flexibility to adopt different media strategies deemed appropriate by individual communities and not the use of a single national strategy.

ONDCP expressed concern that we had not discussed Westat's hypothesis concerning why the campaign might have contributed to youth experimentation with marijuana. We are unable to draw a conclusion about this hypothesis based on Westat's report, nor do we have additional information upon which to base an assessment. ONDCP also faults our report for not discussing other potential competing explanations for the substantial downturn in teen drug use and increase in anti-drug attitudes. Although this is beyond the objectives of this report, we note that multiple other indicators of youth responsibility also seem to be trending in a positive direction at the same time that MTF reports declines in youth drug use. For example, from 1991 through 1999, the teen pregnancy rate declined by 27 percent and from 1991 through 2002, the teen birth rate fell 30 percent. Similarly, the number of juvenile homicides declined by 44 percent from 1993 to 2002, and the juvenile violent crime arrest rate fell by more than 40 percent from 1994 to 2003. All of these trends—including declines in drug use—could be related to broader environmental, familial, or other influences. The coincidence of these trends with drug use trends indicates that factors other than the campaign could be responsible for the decline in drug use and points to the necessity of trying to isolate the effects of the campaign, rather than relying upon simple correlations.

Steps Taken to Remedy Potential Problems

ONDCP states that it has taken extensive "due diligence" steps that are briefly acknowledged in our report, but that our report "fails to acknowledge the thoroughness of our actions to identify, assess, and attenuate any possible negative consequences of the campaign once Westat reported the possibility of such an effect." Apart from those actions described in Westat's evaluation reports, a full discussion of the steps that ONDCP took in response to Westat's interim evaluation reports that highlighted the possibility of unintended negative consequences of

exposure to the campaign on youth initiation of marijuana was not salient to our assessing whether Westat took appropriate steps to address the evaluation implementation challenges that it faced. However, Westat's findings for the period from 2002 to 2004 showed that the campaign also was not effective after ONDCP took these steps.

ONDCP Cites Major Changes in Campaign

ONDCP states that the campaign is substantially different from what it was when the last data were collected by Westat more than 2 years ago. We are not in a position to comment on ONDCP's new campaign ("Above the Influence"), launched in November 2005, as these current efforts are beyond the scope of our report and outside the time frame of the Westat data collection. At this time, neither we nor ONDCP have empirical information with which to assess this revised campaign. However, Westat's evaluation showed that neither the campaign as initially implemented nor the redirected campaign implemented after 2002 was effective. Hence, although a new and improved campaign may be effective, Westat's findings raise concerns about whether any campaign can affect youth drug use, especially since the lack of effect does not seem to be related to recognition of campaign ads, but rather to subsequent impact on attitudes and behaviors. Finally, ONDCP cites the receipt of awards from both the advertising and communications industry for its newest campaign. While laudable, these awards are not evidence that the new campaign will change youth drug attitudes and behavior. Only an independent evaluation can assess the current campaign's effectiveness.

ONDCP Offers an Alternative Explanation for Counterintuitive Results

ONDCP stated that there is growing research evidence showing that asking people a question about their future behavior influences the subsequent performance of the behavior in question. ONDCP then indicates that the use of a panel design for the Westat study with repeated interviews of youth concerning drug attitudes and behaviors might, itself, have resulted in increased perceptions that drug use is widely pervasive among youth. If, during the course of the Westat study, ONDCP and NIDA, who acted as monitor for the study, felt that the study itself—that repeated interviews of youth by Westat concerning the campaign and drug attitudes and behavior—was resulting in a negative effect, it would have been appropriate for them to discontinue the study to avoid potential harm to subjects. Although ONDCP raised this issue in its comments to us, neither ONDCP nor NIDA mentioned this issue in any of our previous meetings specific to this engagement.

ONDCP Takes Issue with the Timing of Our Review

ONDCP said that the "long delay" in receiving our assessment of the Westat report has prevented it from making progress on the next round of evaluation. We note that Westat's draft final report was not made available to us until spring 2005 (not 2 years ago as seems to be indicated in ONDCP's comments). The volume of reports from the 4½-year study, and the complexity of the review required a great deal of time from our most skilled social scientists and statisticians. Time was required to ensure that our review of the Westat study was both comprehensive and correct.

Points Concerning Our Matter for Congressional Consideration

ONDCP said that our matter for congressional consideration—that Congress consider limiting appropriations until ONDCP is able to provide credible evidence of the effectiveness of exposure to the campaign on youth drug use outcomes—offers insufficient detail concerning how to demonstrate satisfactory evidence of progress and that it was puzzled by our lack of recommendations to ONDCP for improving the campaign. Our mandate was to assess Westat's evaluation and to draw conclusions about the reliability of its findings so that Congress could make decisions about funding for the campaign, and developing suggestions for improvements to the media campaign itself was beyond our scope. In so doing, we focused on Westat's methods and efforts to address challenges in implementing the evaluation. Our matter for congressional consideration was intended to allow ONDCP to explore a number of approaches to providing credible evidence of campaign effectiveness to Congress. Our report clearly indicates that one approach is the one applied in the Westat evaluation, which is the focus of this report, but we do not want to rule out other approaches. At the same time, we acknowledge that providing such evidence is not easy.

ONDCP Posits Consequences of Further Budget Cuts

ONDCP states that further budget cuts to the campaign could have far-reaching and unfavorable consequences in youth drug use. Given that the Westat findings show that the campaign was not having a positive impact, we found no evidence that a reduction in campaign advertisements would have a negative impact. ONDCP cites the 2005 MTF as an indicator of media campaign effectiveness by indicating that the reduction in anti-drug messages has resulted in a flattening of 8th graders' perception of risk. Again, as ONDCP has indicated, the relationship cannot be assessed with MTF because it does not ask respondents about their exposure and reactions to the messages of the media campaign that can then be linked to their drug-related attitudes and behaviors.

Failure to continue the media campaign's efforts, according to ONDCP, is "raising a white flag to those who favor drug legalization, with the expectation that youth drug use soon would begin to rise, reversing years of hard-earned positive news." In our view, on the other hand, continuation of programs that have been demonstrated not to work diverts scarce resources from programs that may be more effective.

We are sending copies of this report to other interested congressional committees and the Director of the Office of National Drug Control Policy. We will make copies of the report available to others upon request. In addition, the report will be available at no charge on GAO's Web site at http://www.gao.gov.

If you or your staff have any questions about this report, please contact either Nancy Kingsbury at 202-512-2700 or by e-mail at KingsburyN@gao.gov or Laurie Ekstrand at 202-512-8777 or by e-mail at EkstrandL@gao.gov. Contact points from our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors are listed in appendix III.

Sincerely,

Nancy Kingsbury, Managing Director
Applied Research and Methodology

Laurie E. Ekstrand, Director
Homeland Security and Justice

Appendix I: Westat's Methods for Addressing Evaluation Implementation Issues

This appendix provides additional details about how Westat's addressed evaluation implementation issues related to the coverage of the National Survey of Parents and Youth (NSPY), sample attrition, and its analytic methods.

Coverage in the NSPY

The NSPY was a nationwide household survey of youth aged 9 to 18 and their parents. Westat used a dual-frame sampling frame—or list of the members of the population from which the sample was ultimately selected. One frame—the area frame—consisted of housing units that had been built by late 1991; the second frame—the building permit frame—consisted of building permits issued between January 1990 and December 1998 for new housing.[1] Combined, these frames constituted an estimated 98 percent of dwelling units nationwide that existed by the end of 1998.

A household had to meet two criteria in order to be eligible to be included in the NSPY sample: It had to (1) contain children within a specified age group and (2) be a housing unit that was built before April 1, 1990, was a mobile home, or was selected from a roster of building permits for new housing units issued between January 1990 and December 1998. To identify households that met these conditions, Westat drew a sample of dwelling units and from this sample it screened households to determine their eligibility for inclusion in the NSPY, that is, whether a household contained children in a specified age group, where the specified age groups were children aged 9 through 13, 12 and 13, or 9 through 18.

According to estimates provided by Westat, after completing enrollment in the NSPY—which occurred during waves 1 through 3—the NSPY sample covered more than an estimated 95 percent of occupied dwelling units (households) nationwide. From its sample of occupied dwelling units, Westat developed rosters of households that were believed to contain youth in the target age range. At this second stage of sample enumeration, Westat experienced a drop-off in the coverage of households that were

[1]Housing units built after 1998 had no chance of selection in either sampling frame. Also, a housing unit had no chance of selection if it had been built during the 1990s in a jurisdiction where no permit was required. Finally, modular housing built during the 1990s was inadvertently omitted from the permit sample. Any biases resulting from excluding housing units built after 1999 are likely to be small, as they constituted a small fraction of all housing units in the NSPY sampling frame, and they were accounted for by Westat's poststratification adjustments. For example, housing units built after April 1999 accounted for an estimated 1.0 percent of all housing units in existence in the time period covered by the wave 1 sample.

believed to be eligible for inclusion in the sample. The number of eligible households enumerated in the NSPY was 30 percent smaller than the number expected from the 1999 Current Population Survey (CPS) data.

According to Westat, coverage losses in the NSPY could have occurred for several reasons: (1) because an interviewer may have decided to classify a household as an ineligible household rather than as a nonresponding household, (2) because the household respondent took cues from the screening questions to avoid selection into the sample by giving an incorrect answer, or (3) because the doorstep enumeration process was considered to be intrusive. Westat reported that it could not conclusively rule out the first explanation for coverage losses. However, it undertook sample validation procedures that examined whether ineligible households in the recruitment waves were misclassified, and it found none. Neither Westat nor the National Institute on Drug Abuse reported that undercoverage was primarily due to respondents avoiding selection into the sample by taking cues from the screening questions and giving incorrect answers as a way to avoid selection into the sample. Overall, Westat reported that the main reason for undercoverage was the rostering component of the survey, which required actual entry into the home, and led to "a great many respondents" asking the interviewer to come back at a later date, only to repeat the request when the interviewer reappeared. Westat inferred that this represented passive refusal to participate. Therefore, according to Westat, most of the coverage losses occurred during the doorstep screening process in which simple, focused screening questions about the composition of the household were used to identify households from which to sample eligible youth.

NSPY and CPS Comparisons of Distributions on Analyzed Variables

In response to questions from us, Westat provided data that indicated that the coverage losses in the NSPY did not result in differences in the estimated distributions of population characteristics from the NSPY as compared with those estimated from the CPS data. In other words, the distributions of characteristics of eligible households with youth included in the NSPY were broadly consistent with a variety of corresponding distributions from the 1999 Current Population Survey.

The comparisons of NSPY-estimated populations to CPS-estimated populations were based on weighted NPSY estimates, where the weights adjusted for nonresponse at the doorstep and household enumeration (roster) stages, and the weights also reflected the differential probabilities of retaining a household for the NSPY depending on the screener group to which it was applied. These weights were calculated prior to Westat's

poststratification calibration techniques, which brought the estimated NSPY population totals into line with the estimated CPS population totals. Hence, if upon using the weights based only on the probability of selection and nonresponse adjustments, the population characteristics in the NSPY differed widely from those derived from the CPS, this would constitute evidence of potential bias in the NSPY sample due to undercoverage.

Westat compared NSPY and CPS distributions for each of the three enrollment waves of the NSPY (waves 1 through 3) on several variables, including the race/ethnicity of the householder and the presence of males 28 years of age or older, the distribution of eligible households by the age of the youth in the household, the age and gender distributions of youth, and the age distributions of youth by race and ethnicity. Each of these comparisons involved discrete subgroups within the focused subpopulation of the NSPY. The largest differences between the NSPY and CPS estimates arose in the comparison of the distributions by race/ethnicity of household and the presence of a male 28 years of age or older in the household. Some of these differences could also arise from sampling variance, as both the NSPY and CPS estimates are based on samples that are subject to sampling errors. Although Westat did not provide sampling errors with the estimates that it provided to us, some of the differences in distributions could be apparent, as opposed to real, differences, in statistical terms.

Undercoverage in the NSPY and Other Widely Known and Used Longitudinal Surveys

Coverage issues are not an uncommon problem with surveys that focus on relatively small subpopulations within a larger population, such as occurred with the NSPY's focus on youth aged 9 to 18. The NSPY's target population of households with youth aged 9 to 18 focused on a subpopulation that, according to 1999 CPS data, constituted about 25 percent of the roughly 104 million households in the United States.

The estimated extent of undercoverage of eligible youth in the NSPY was comparable to the extent of undercoverage in other well-known and widely used longitudinal surveys. Both the National Longitudinal Survey of Youth (NLSY)—sponsored by the Bureau of Labor Statistics—and the National Immunization Survey of Children (NIS)—sponsored by the National Immunization Program (NIP) and conducted jointly by the NIP and the National Center for Health Statistics of the Centers for Disease Control and Prevention—focus on specific subpopulations, and both experienced undercoverage that was comparable to that of the NSPY. The 1979 NLSY is a nationally representative sample of men and women born in the years 1957 to 1964 who were ages 14 to 22 when first interviewed in

1979. It had a coverage rate of 68 percent. The 1979 NLSY has been widely used and cited to examine a wide variety of policy issues. As documented in the National Longitudinal Surveys' annotated bibliography, about 3,100 journal articles, working papers, monographs, and other research documents have been catalogued as having used the 1979 NLSY data. The target population for the NIS is children between the ages of 19 and 35 months living in the United States at the time of the interview, and it has been conducted annually since 1994. The survey involves the selection of a quarterly probability sample of telephone numbers, and the coverage has been about 20 percent lower than estimated by two other benchmark surveys. Survey data are used primarily to monitor immunization coverage in the preschool population in the nation and to provide national, state, and selected urban area estimates of vaccination coverage rates for these children.

Sample Attrition across NSPY Interview Rounds

In the NSPY, respondents initially recruited into the sample were to be tracked for three additional survey rounds that covered about a 3-year period following the recruitment round. By the final survey round of the NSPY, the cumulative response rate—the percentage of youth or parents in eligible households that completed all four interviews—reached between 50 percent and 55 percent. These cumulative response rates after four survey rounds were determined largely by the response rates during the enrollment waves, as postenrollment, Westat was able to track, contact, determine eligibility for reinterview, and complete interviews for between 82 percent and 94 percent of previously interviewed respondents between two successive interview waves. The response rates achieved for the first three survey waves—the enrollment waves—were generally similar. Specifically, about 74 percent to 75 percent of the dwelling units determined to be eligible for the survey in waves 1 through 3 completed the household enumeration (or rostering of youth). After obtaining consent to conduct interviews from parents and youth, interviewers completed extended interviews—that is, completed the full NSPY questionnaire—with about 91 percent of the sampled youth in each of waves 1 through 3. Among sampled parents, about 88 percent gave consent and completed extended interviews in the enrollment waves. (See table 2.)

Table 2: NSPY Survey Rounds and Response Rates, Sampled and Surveyed Youth

Rounds and stages of sampling	Survey waves		
Round 1: enrollment waves	**Wave 1**	**Wave 2**	**Wave 3**
• Percentage of sampled dwelling units for which eligibility was determined	95.1%	95.7%	95.5%
• Percentage of eligible dwelling units completing household roster	74.4%	74.6%	75.3%
• Percentage of youth completing interview	90.3%	91.9%	91.2%
• Cumulative (overall) response rate, enrollment waves	63.8%	65.5%	65.5%
Round 2: first follow-up	**Wave 4**		**Wave 5**
• Percentage of dwelling units (from prior wave) refielded for follow-up	94.2%		92.9%
• Percentage of refielded dwelling units for which eligibility was determined	86.8%		93.8%
• Percentage of youth completing interview	93.5%		93.6%
• Cumulative (overall) response rate	54.1%		58.4%
• Follow-up (conditional) longitudinal response rate	82.2%		88.8%
Round 3: second follow-up	**Wave 6**		**Wave 7**
• Percentage of dwelling units (from prior wave) refielded for follow-up	85.1%		89.8%
• Percentage of refielded dwelling units for which eligibility was determined	93.1%		92.8%
• Percentage of youth completing interview	94.7%		93.8%
• Cumulative (overall) response rate	53.1%		56.0%
• Follow-up (conditional) longitudinal response rate	93.4%		91.6%
Round 4: third follow-up	**Wave 8**		**Wave 9**
• Percentage of dwelling units (from prior wave) refielded for follow-up	78.7%		83.5%
• Percentage of refielded dwelling units for which eligibility was determined	95.9%		94.8%
• Percentage of youth completing interview	94.0%		94.3%
• Cumulative (overall) response rate	50.2%		53.4%
• Follow-up (conditional) longitudinal response rate	92.4%		93.4%

Source: Westat, June 2005.

Across the three follow-up rounds of the NSPY, Westat achieved between an 82 percent and a 94 percent longitudinal response rate. Follow-up required that respondents be tracked over time and across places, as persons enrolled in the sample could move, and their eligibility for a follow-up interview had to be determined. For example, youth who turned 19 years of age between survey rounds would no longer be eligible for reinterview, as they were beyond the target age of the campaign. Efforts to track individuals prior to the second survey round included verifying address change information with the U.S. Postal Service and obtaining location information from a national database company. Westat obtained updated location information from these sources, and telephone

interviewers placed calls to these households to verify the identity of respondents. According to Westat, a high proportion of the households that moved were contacted and respondents verified their new addresses. During the third and fourth survey rounds, Westat used procedures to track and verify addresses that were similar to those used to track respondents from the first to second survey rounds, although Westat modified these procedures as necessary. The key eligibility requirement for youth for a follow-up interview was the youth had to be 18 years of age or younger at the time of the interview.

For the first follow-up round—waves 4 and 5—Westat located individuals and determined eligibility for 92 percent of the youth and 92 percent of the parents who completed an initial interview during the first round of the survey—that is, in waves 1, 2, and 3, and of these youth who were still eligible, 94 percent completed an interview. Among parents from the first round who were tracked and determined to be eligible in the second round, 92 percent completed a second round interview. In the third and fourth survey rounds of the NSPY, between 96 percent and 97 percent of the youth and parents who had completed prior round surveys were tracked and determined to be eligible, and of these, the youth response rates were 96 percent and the parent rates were 95 percent.

Comparisons of Respondents and Nonrespondents across NSPY Survey Waves

Even with the relatively high follow-up response rates that Westat achieved, it is possible that respondents could differ from nonrespondents in follow-up rounds, and if so, the NSPY estimates of the effects of exposure on outcomes would be biased. Westat provided data that compared nonrespondents to the respondents across the three enrollment waves, indicating that with some differences, nonrespondents were generally similar to respondents with respect to characteristics that might affect survey outcomes. Nonrespondents were compared to respondents on gender, age at interview, whether both parents were in the household, the number of youth in the household, the type of household dwelling, and the type of area in which the household was located. For example, apart from the three differences below, nonrespondents and respondents were similar in characteristics across survey waves: In the three enrollment waves, nonrespondents were proportionately older youth than respondents; in waves 2 and 3, there were proportionately more youth living in cities among nonrespondents than respondents; and in wave 1, there were proportionately more youth in the building permit sample among nonrespondents than respondents.

Differences in Sampling Methodologies between NSPY and MTF

Westat compared estimates of drug-use prevalence from the NSPY data with those obtained from other national surveys such as Monitoring the Future (MTF). While the NSPY estimates of marijuana use prevalence differ over some periods covered by the NSPY from those derived from the MTF survey of youth in school, differences between the two surveys' sampling frames and methodologies mean that direct comparisons between the two surveys must be made with caution and must take the methodological differences into account. Specifically, MTF showed a decline in marijuana use for some teenage groups during the 2000 to 2002 period, while the NSPY showed the increases reported above. However, the difference in drug use rates reported from the two surveys could plausibly arise from differences in the sampling frames. The MTF sampling frame covers only youth who are in school and not those who drop out of school, who are truant on the survey day, or who are 17- and 18-year-olds who have graduated from high school. To the extent that high school dropouts and truants have more involvement with drugs than those who stay in school, the MTF estimates of drug use may underrepresent drug use among all youth of high school age. By comparison, the NSPY household survey includes youth who are not enrolled in school in its sampling frame. To the extent that dropping out of high school is correlated with drug use, and given that dropouts are excluded from the MTF sampling frame, differences in drug use between MTF and NSPY could reflect the fact that youth enrolled in high school reported drug use at different rates from all youth in the general population covered by the NSPY, which would include dropouts who may be at higher risk of using drugs.

The Capacity of the NSPY to Detect Reasonably Small Effects

One challenge in designing surveys to evaluate changes in outcomes as the result of an intervention lies in selecting a sample with sufficient power to detect differences between groups—including the same individuals at two points in time—or significant associations among variables, such as between levels of exposure to the campaign and outcomes. Sample size is a major factor determining a study's power to detect differences, and while larger sample sizes will generally allow researchers to detect smaller differences over time, as the size and power of a sample to detect changes increases, so too generally does its cost.

In consultation with the National Institute on Drug Abuse (NIDA), Westat chose to compute power for analyses of annual change in a prevalence statistic—that is, change in the percentage of a population that reported an outcome. For purposes of its power analysis, Westat chose to assume different baseline prevalences for parents and for youth of all ages and to

assume that the study should be able to detect reliably declines of specified sizes. For example, for youth of all ages, Westat assumed a baseline prevalence of 10 percent and determined the power of its sample for detecting a minimum downswing in an outcome—such as past-month drug use—of 2.3 percentage points over a year.[2] The power of the sample to detect this difference was well within conventional power criteria.[3]

As reported above, the sizes of differences that Westat's sample could detect were consistent with the Office of National Drug Control Policy's (ONDCP) goals for the campaign. In early meetings on the design of the evaluation of the media campaign, ONDCP officials reported that ONDCP had a specific Performance Measures of Effectiveness (PME) system and that the campaign was embodied within the first goal of the National Drug Strategy, which was to "educate and enable America's youth to reject illegal drugs as well as the use of alcohol and tobacco." Under this goal, ONDCP's PME proposed targets for reducing the prevalence of past-month use of illicit drugs and alcohol among youth from a 1996 base year: by 2002, reduce this prevalence by 20 percent, and by 2007, reduce it by 50 percent. ONDCP officials further identified specific targets for the media campaign, again with respect to a base year of 1996: by 2002, increase to 80 the percentage of youth who perceive that regular use of illicit drugs, alcohol, and tobacco is harmful; and by 2002, increase to 95 the percentage of youth who disapprove of illicit drug, alcohol, and tobacco use. To achieve a goal of 80 percent of youth who perceive that regular use of marijuana is harmful would require increasing the 1996 baseline percentage of youth perceiving marijuana as harmful from 60 percent, as measured by MTF, or by about 3.3 percentage points per year from 1996 to 2002. Westat's sample had sufficient power to detect this amount of annual change in youth attitudes.

The power of the NSPY to detect changes in outcomes due to exposure to the campaign also presumes that it was possible to accurately measure and characterize exposure to the campaign by the reported number of advertisements recalled by respondents. While the general question of

[2]The power to detect differences for upswings in prevalence would depend upon the baseline level. However, the power to detect an upswing from a baseline of 90 percent of youth would be exactly the same as that for detecting a downswing from a 10 percent baseline.

[3]Specifically, the minimum detectable difference for wave-to-wave changes was at least 80 percent using a one-sided hypothesis test at the 0.05 level.

how exposure to advertisements affected respondents was beyond the scope of the evaluation, if by exposure is meant a recognition-based task—or encoded exposure—then the NSPY measures of exposure can be viewed as valid. According to communications researchers, often what is of interest to campaign planners and evaluators is whether the presentation of campaign content generates at least a memory trace in individuals. At this point, a potential audience member can be said to have engaged the campaign's presentation in a meaningful sense, and this is what is meant by encoded exposure. To measure exposure to the campaign for both youth and parents, NSPY interviewers asked respondents about their recall of specific current or very recent television and radio advertisements.[4]

There was variation in recall of advertisements by both youth and parent respondents, and this type of variation is needed in order to examine associations between levels of exposure and outcomes. For example, for the entire campaign, youth reported a median of 12 exposures per month, and 76.7 percent reported 4 or more exposures per month. Comparatively few youth—about 6 percent—reported less than 1 exposure per month. Youth recall of specific exposure also varied, as 41.2 percent of youth reported 12 or more television exposures per month throughout the campaign while reporting a median of 4.4 exposures to television advertisements. Additionally, Westat's measures of exposure and outcomes have demonstrated sensitivity to detect favorable campaign effects among parents.

Westat's test for associations between exposure and outcomes—the gamma coefficient—was an ordinal test statistic for whether two variables (e.g., exposure and marijuana use initiation) have a montonic, but not necessarily a linear, relationship. Therefore, were there nonlinear relationships, its test would have allowed for them. Finally, nonrandom measurement error in the measure of exposure is unlikely to have biased estimates of campaign effects, as if the nonrandom measurement error were constant, it would not affect measures of association, and if it was not constant, it would be addressed by Westat's statistical methods.

[4]Each respondent was presented ads that had been broadcast nationally in the 2 calendar months prior to the interview.

Westat Methods to Measure Outcomes

Westat measured a variety of outcomes for youth and parents and took steps to ensure that the measures were consistent with existing research. The youth questionnaires included numerous questions that were designed to measure exposure to the campaign advertisements and other anti-drug messages. The youth question domains included exposure propensity to media; current and past use of tobacco, alcohol, marijuana, inhalants, and Ecstasy; past discussions with and communication of anti-drug messages from parents and friends; expectations of others about respondent's drug use; knowledge and beliefs about the positive and negative consequences of drug use; exposure to campaign messages; family and peer factors; personal factors; and demographic information. Westat used two separate questionnaires for youth of different ages; one questionnaire was used for children (aged 9 to 11) and another one was used for teens (aged 12 to 18).

The NSPY parent questionnaire also included numerous questions that were intended to measure parents' exposure to the campaign's messages and other anti-drug messages. The question domains for parents included media consumption; past discussions with child about drug attitudes and avoidance strategies; past child monitoring behaviors; self-efficacy of discussing drugs with child and monitoring of child's actions; belief that the child is at risk of drug use; belief that drug use has bad consequences; exposure to the campaign's advertising, including brand recognition; parent's own current and past use of tobacco, alcohol, and drugs; and demographic information.

Westat followed generally accepted procedures in developing the survey instruments for the NSPY by using information from a prototype prepared by NIDA and using information from other surveys that addressed youth drug use and prevention. Prior to the phase III evaluation, and in preparation for the NSPY, NIDA convened an expert panel to assist in the development of the youth and parent questionnaires. The panel, which consisted of experts in adolescent drug use prevention and parenting behaviors, drafted NSPY survey questionnaires for children, teens, and parents, and NIDA shared these prototypes with Westat at the beginning of Westat's evaluation contract. In developing the final questionnaire for the NSPY, Westat created a questionnaire development team consisting of evaluation experts. In developing the final NSPY questionnaires, the Westat team reviewed NIDA's prototype and other surveys.

Westat measured youth drug use by self-reported data on use. We have previously cautioned about limitations associated with self-reported data on youth drug use.[5] Additionally, the National Research Council (NRC) of the National Academy of Sciences also has pointed out limitations associated with self-reported drug use in national surveys such as the National Survey of Drug Use and Health (NSDUH) and MTF.[6] As NRC has pointed out, while self-reported data on drug use may have limitations for estimating the actual levels of use at a particular point in time, they may not suffer from these same limitations when they are used to assess changes in use over time, unless there is reason to believe that attitudes about drug use change in ways that affect respondents' willingness to honestly report drug use, or stigma.

Specifically, if there is a stigma associated with self-reporting drug use, that stigma may affect the levels of use reported, as some have argued that the propensity of respondents to give valid responses may be affected by social pressures. In particular, the incentive to give false negative reports may increase over time if drug use becomes increasingly perceived as harmful or socially unacceptable. Using data from NSDUH and MTF, NRC showed an inverse relationship between the percentages of respondents who either disapproved of illegal drug consumption or perceived it to be harmful. Thus, as stigma increased, self-reported drug use decreased. As NRC cautioned, one could interpret this relationship as indicating that changes in stigma are associated with changes in invalid reporting, or as stigma increases, false negative reports increase, rather than necessarily indicating that as stigma increases, drug use decreases.

The NRC analysis leads to two inferences: First, if social stigma remains constant over time, changes in the propensity to give valid responses would be unaffected and estimates of change in self-reported drug use would not be biased by social stigma. For the evaluation results, this would imply that its measures of changes in self-reported drug use would provide valid measures of changes in use, so long as factors other than stigma did not affect the propensity to self-report use. Second, if the social stigma associated with reporting drug use is inversely related to disapproval of illicit drug use or increased perceptions that it is harmful,

[5]GAO: *Drug Use Measurement: Strengths, Limitations, and Recommendations for Improvement*, GAO/PEMD-93-18 (Washington, D.C.: June 25, 1993).

[6]National Research Council, *Informing America's Policy on Illegal Drugs: What We Don't Know Keeps Hurting Us*. National Academy Press, Washington, D.C.: 2001.

then the estimates of self-reported drug use are likely to decrease as a result of the stigma. According to results from the evaluation, trends in youth attitudes and beliefs about illicit drugs changed significantly over the entire campaign in a direction that was favorable to the campaign. Specifically, the trends in youth attitudes and beliefs about illicit drug use meant that youth were more likely to believe, as the campaign went on, that use of illicit drugs was likely to have negative consequences. Alternatively, the social stigma associated with drug use increased over time. If the relationship between stigma and reporting that NRC found held and applied to the data in the evaluation of the campaign, this would imply that the increased stigma associated with drug use would lead to decreases in self-reports of drug use over time.

Westat's Analytic Methods

To control for the many factors that could have influenced both exposure and outcomes independently of, or in conjunction with, the campaign, Westat used propensity scoring methods to match individuals based on numerous measured attributes and to create groups of individuals who differed on their underlying propensity to be exposed to different levels of campaign advertisements. A propensity score is a weighted sum of the individual effects of variables in a model that predicts the likelihood of exposure to campaign messages. Westat's propensity scoring methods resulted in the creation of groups of individuals who were statistically similar on exposure propensities. These groups can be considered as statistical analogues to randomly assigning individuals to different levels of exposure. After creating these groups, Westat then analyzed outcomes between the groups having different propensities to be exposed to campaign messages.

Westat used ordinal logit models to estimate the chances of being exposed, where exposure was measured alternatively as a three- or four-level variable—e.g., low, medium, or high exposure.[7] Westat used a myriad of variables to predict exposure levels in both the youth and parent models. For example, in the youth models, the propensity score models included measures of demographic attributes, educational attainment and educational aspiration, family and parent background, parent consumption

[7]Propensity score methods have been demonstrated to be robust against bias associated with the specification of incorrect functional forms—e.g., linear rather than quadratic—of variables.

of television and other media, income and employment, reading habits, Internet usage, location of residence in urban areas, among other variables. After estimating models, Westat also assessed the balance of variables in its propensity models. For propensity models to remove the effects of confounding variables from the association between exposure and response, it is necessary that the population means of the confounder variables not vary across exposure levels. If a confounder is successfully balanced, then it will have the same theoretical effect across all exposure levels.

The net result of the propensity scoring models is to provide each individual with a score that reflects the individual's propensity to recall advertisements based upon a weighted sum of all of the variables in the model. Therefore, while two individuals may differ on the likelihood that a particular variable affects their chances of being exposed to messages or on their levels of a certain variable—such as age or education—they could be similar in their overall propensity to be exposed to campaign messages if the differential effects of any individual variables sum to the same total propensity.

In order for the results of propensity methods to be valid, it is important that the propensity scoring models include all relevant variables that could otherwise explain differences in both exposure and outcomes. Propensity score models can adjust only for confounding variables that are observed and measured. In other words, they are built upon the assumption that all relevant variables are measured and controlled for. If an important variable is omitted from the propensity model, the results of analyses may be affected. Westat made reasonable attempts to identify and control for a variety of confounding variables, include them in its models, and reduce bias.

Appendix II: Comments from the Office of National Drug Control Policy

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF NATIONAL DRUG CONTROL POLICY
Washington, D.C. 20503

August 10, 2006

Mr. David M. Walker
Comptroller General
Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Walker:

I am writing in response to your request for comments on the Government Accountability Office (GAO) report (GAO-06-818) entitled, "Contractor's National Evaluation Does Not Find That the Youth Anti-Drug Media Campaign Was Effective in Reducing Youth Drug Use." I appreciate the opportunity to respond to the findings and recommendation made in the report and to provide you with additional information on how the Office of National Drug Control Policy is dedicated to the task of reducing youth drug use through media outreach.

I have a number of concerns with the Westat findings and your report's assessment of them. In brief: 1) Westat's evaluation is ill-suited to judge the impact of an ad campaign; 2) the findings are now more than 2 years old and have limited relevance; 3) conflicting evidence from other research is given minimal attention; 4) the Campaign has undergone major changes – with encouraging results to date; 5) our "due diligence" efforts to address the potential for harm are not well characterized; and 6) your recommendation to Congress offers insufficient detail to demonstrate satisfactory evidence of progress. Finally, I have identified probable consequences of further cuts to the Campaign budget that might be made pursuant to your recommendation to Congress.

Westat Evaluation is Ill-Suited to Judging Impact of an Advertising Campaign

Major advertisers, who spend billions of dollars annually on advertising in the U.S. and abroad, do not attempt to establish a causal relationship between advertising exposure and product sales, but evaluate the success of their advertising campaigns by rigorous testing of individual ads prior to air (which the Campaign has consistently done with increasing rigor), monitoring the performance of the ads once aired (which the Campaign has done) and by carefully developing *correlations* between various advertising messages, levels of media expenditure, and consumer attitudes and behavior.

Establishing a *causal* relationship between exposure and outcomes is something major marketers rarely attempt because it is virtually impossible to do – particularly if both a pre-advertising baseline and / or unexposed control groups are lacking. As a senior market researcher at a major advertiser has recently said, "Even when campaign design includes a media blackout region as a control (inappropriate for a public-service campaign), non-measured factors make it impossible to isolate the effect of a single advertisement or advertising campaign."

This is one reason why the "truth" anti-tobacco advertising campaign, acclaimed as a successful initiative in view of the significant declines we've seen in teen smoking, did not claim to prove a causal relationship between campaign exposure and smoking outcomes, reporting instead that the campaign was associated with substantial declines in youth smoking. They relied instead on the correlations between campaign weight levels in various markets (they were able to vary advertising weight by market) and teen behavior in those markets as tracked by the University of Michigan's "Monitoring the Future" survey (see *American Journal of Public Health*, March 2005, "Evidence of a Dose-Response Relationship Between Antismoking Ads and Youth Smoking Prevalence").

Consequently, we take issue with the fundamental method pursued by Westat and GAO, and therefore, believe that the study's findings are deeply flawed.

Findings are "Old News"

Your report's findings do not come as a surprise to us, for each year as preliminary results have been made known to us, to Congress, and to the public through media coverage, we have studied the reports and have sought to improve the performance of the Campaign, using these and other data that we have available. We have responded when such findings, although not conclusive, were released to the public or to researchers, and have dealt with criticisms of the Campaign from adversaries, including those who advocate the legalization of drugs. And we have periodically needed to place these findings in context, especially because all major youth surveys report declining teen drug use, including Monitoring the Future, which documents a 19% decline in current illegal drug use among 8th, 10th and 12th graders combined over the past four years, and a 21% decline in marijuana use from 1998 to 2005 among these youth.

Conflicting Evidence from Other Research

Although two recent studies that report findings contrary to Westat (Longshore and Palmgreen) are cited, no assessment of their importance is provided. GAO does not explain why such studies are not given more credence. For example, Longshore examined the possibility of synergistic effects between in-school drug education and the Campaign, and concludes that results "...showed that marijuana use in the past month was significantly less likely among adolescents who received both the ALERT Plus curriculum and weekly exposure to the Campaign's anti-drug media messages." This has significant implications nationally, and should not be dismissed. Palmgreen *et al*, whose paper has now been accepted for publication in the prestigious peer-reviewed *American Journal of Public Health,* concluded that the Campaign's marijuana initiative "reversed upward developmental trends in high sensation seeking 30-day marijuana use and significantly reduced positive marijuana attitudes and beliefs in this at-risk population."

Another recent peer-reviewed journal article (Slater *et al*, "Combining in-school and community-based media efforts: reducing marijuana and alcohol uptake among younger adolescents," in *Health Education Research – Theory and Practice,* September 2005) which evaluated the results of an in-school media campaign in 16 cities (8 campaign cities and 8 control communities) with a similar strategy and brand to our new Above the Influence campaign, has

shown very positive results. The authors conclude that "substance use uptake for youth in treatment communities was half or less than that of control communities" and that "effectiveness did not depend on the presence of an in-school prevention curriculum."

Your analysis thoughtfully acknowledges the serious challenges that Westat faced, due to a lack of a baseline and control group, the difficulties of retaining youth and parents in the study over the years, and the need to sort out other possible influences. These complexities add support to your expressed view that "…virtually all social science research is imperfect."

Westat, in its assessment of why the Campaign might potentially have contributed to youth experimentation with marijuana, seems to rely on the argument that frequent exposure to the Campaign's anti-drug messages leads youth to conclude that most youth are, in fact, using marijuana, and in an effort to "fit in" with their peers, they decide to try marijuana. No theoretical basis for such an argument is provided in your report, nor is there any critique of the Campaign's underlying theory, the well-tested Theory of Reasoned Action. Therefore, this reported effect is wholly counterintuitive because, by Westat data, it is clear that youth are seeing the Campaign's anti-drug ads, seeing them frequently, recalling and assessing them evermore favorably, holding ever-stronger anti-drug attitudes, receiving fewer offers of marijuana, and overall using drugs (including marijuana) less and less. No competing explanation for the substantial downturn in teen drug use or increase in anti-drug attitudes is offered.

Further, key studies, including both Monitoring the Future (MTF) and the Partnership Attitude Tracking Study (PATS -- conducted by Roper for the Partnership for a Drug-Free America) report positive attitude changes. PATS data reveal that in the past few years more youth are likely to say most teens don't smoke marijuana, and those who say they have friends who smoked marijuana declined substantially. Further, according to MTF, teens are increasingly likely to disapprove of trying marijuana, and these higher rates of disapproval are associated with lower rates of current use, especially among 10th graders, the core target audience of the Campaign. And in an analysis conducted of National Survey of Drug Use and Health (NSDUH) data, youth who reported having seen or heard media prevention messages in the past year were significantly less likely to report illicit drug use. And some states and communities are observing that as teen drug use is declining, student surveys report an increase in the number of youth who say their peers disapprove of drug use and attribute the good news in part to anti-drug media messages (Coalition for a Drug Free Greater Cincinnati). Your report makes no claims that other media campaigns, or in-school drug education (which youth say they are getting less and less of) or other influences are responsible for these substantial shifts in beliefs, attitudes, and behaviors.

"Due Diligence" Steps Taken to Remedy Potential Problems

We have taken extensive "due diligence" steps which are briefly noted in your report. The report, however, fails to acknowledge the thoroughness of our actions to identify, assess, and attenuate any possible negative consequences of the campaign once Westat reported the possibility of such an effect. We have convened experts from mass communication, youth drug prevention, advertising, behavioral research, and related fields to explore what might be the theoretical basis for such potential effects. We have implemented recommendations to

strengthen qualitative and quantitative research methods to probe for such effects in subsequent advertising, and have made continual refinements in message strategy and have developed protocols for minimizing possible normative perceptions. We have increased the sensitivity to such a possibility among advertising planners of the Partnership for Drug-Free America – which under our direction provides most of the advertising for the campaign – as well as the *pro bono* advertising agencies who contribute their creative talents to the campaign. Further, we have strengthened our ability to detect any such effects through our monthly tracking studies which monitor youth responses to the media messages they are seeing and hearing.

Major Changes in Campaign

The Campaign is now substantially different from that which was measured when the last wave of data was collected by Westat more than two years ago. The Campaign has changed direction to be even more relevant to today's youth, and after a full year of research, last November launched a new brand, "Above the Influence." Designed to encourage youth to aspire to their full potential by avoiding the negative influences in their lives – specifically drugs and peer influences to use drugs – this new brand already is showing positive results in brand awareness (exceeding within six months the awareness of the previous brand, the Anti-Drug), perception of the risk in using drugs, and anti-drug attitudes, as revealed by monthly tracking surveys that are typical of advertising industry "best practices" for measuring an advertising campaign. This new Campaign has the breadth to address not only marijuana but other emerging drug threats, including methamphetamine and non-medical use of prescription drugs and over-the-counter medicines. We are pleased to report that "Above the Influence" already has won significant advertising and communications industry awards, including the prestigious Media Week "Media Plan of the Year," for campaigns spending $25 million or more, the American Association of Advertising Agencies Jay Chiat Planning Award (the top honor for creative planning and strategy in its category), and two Webby Awards, including Best Youth Web Site of 2006, given by the International Academy of Digital Arts and Sciences.

An Alternate Explanation for Counterintuitive Results

A possible explanation for these counterintuitive findings could be a function of what is theorized by Westat to occur with heavy exposure to anti-drug messages. There is growing evidence from research in psychology and consumer behavior that asking people a question about their future behavior influences the subsequent performance of that very behavior, known as the "mere measurement effect." The Westat evaluation, by conducting an extensive interview of youth (and their parents) in their homes, including showing them the ads being studied on as many as four separate occasions over the life of the evaluation, could stimulate interest in drugs where none previously existed, increase beliefs that drugs are important to youth and that more teens are using drugs, thus stimulating interest in and causing intent to use drugs and eventual drug experimentation. Impressionable youth, being inherently interested in pursuing behaviors that they believe would make them more grown-up, arguably would be more sensitive than adults to the effects of the evaluation interviews. One recent peer-reviewed journal article, for example, reported that "…when a question is asked about a socially non-normative health behavior (i.e. illegal drugs), instead of decreases in the behavior we see increased rates of the non-normative behavior" (Williams, Fitzsimons and Block, "Simply asking questions about

health behavior increases both healthy and unhealthy behavior," *Social Influence,* 2006). Such a problem would be less likely with a study design that used only cross-sectional surveys, but the frequency and intensity of youth interviews required by the Westat longitudinal design clearly would result in a greater impact of this type on survey respondents.

Consequences of Delayed Report

The long delay in receiving the GAO assessment of the Westat report has had serious operational consequences, such as severely compromising our ability to make progress on the next round of evaluation. More than two years ago, ONDCP announced an RFP for the new outcome evaluation, but in subsequent discussions GAO strongly discouraged us from pursuing that course because of the difficulty of evaluating this Campaign. GAO even posed a probable recommendation that we should first undertake an evaluability assessment. That recommendation is now not put forward by GAO. As a result, our plans for evaluation when resumed after more than two years will not provide meaningful outcome evaluation for several years to come. Meanwhile, we continue to use monthly tracking surveys to monitor Campaign progress, and although such studies cannot give us long term outcome data, they do permit real-time tracking of performance and allow for effective decision-making.

Your Recommendation

Finally, we are puzzled as to the lack of recommendations for improvement of the Campaign, given the GAO's extensive review of the Westat results. For example, after the GAO staff briefing more than a year ago, we anticipated specific recommendations on future Campaign evaluations, or on Campaign theory, design, or implementation. While we appreciate your understanding that the Campaign has rigorously applied enormous expertise to the Campaign and has made continual improvements, we are concerned with your conclusion that the result as judged by Westat "…raises questions concerning the understanding of the factors that are most salient to teens' decision making about drugs and how they can be used to foster anti-drug decisions." In addition, while your recommendation to Congress is clear, there are no criteria set forth for or even a cursory discussion of how one might demonstrate "…credible evidence of the effectiveness of the campaign on drug use outcomes" especially given the widely-accepted understanding that a media campaign, in and of itself, should not be held uniquely responsible for reductions in teen drug use.

Consequences of Further Budget Cuts

I want to make it clear that the consequences of further budget cuts to the campaign could have far-reaching and unfavorable consequences. Lessons learned from relevant youth health behaviors include recent evidence on tobacco use among teens which reveals that the downturn in media exposure to anti-tobacco messages already is resulting in decreased perception of risk, which more than 30 years of research shows is directly related to smoking rates (the same is true for illicit drugs, including marijuana). The 2005 MTF reported that all three grades surveyed showed a decline in weekly exposure to anti-tobacco messages, and the rate of decline of smoking is slowing and in fact has halted among 8th graders, who have been the bellwethers of smoking trends among teens. Previous studies have established a relationship between exposure

to anti-tobacco messages and smoking rates among teens. CDC has observed that smoking prevention media campaigns are effective in reducing youth smoking initiation and has expressed concern that less exposure to such messages may translate to a reversal of the long downward trends in youth tobacco use. We should expect similar results for illicit drug use if anti-drug messages decline, and, in fact, already the MTF in 2005 has detected among 8th graders a flattening out in the previously increasing perception of risk, due to somewhat lower media exposures.

Further, because mass media and popular culture convey a pervasive and disheartening array of pro-drug messages that reach the nation's youth, further cutting back the Campaign would have the unfortunate result of essentially abandoning our ability to counter those messages with clear, consistent, credible anti-drug messages, which only a national anti-drug media campaign can do. Teens today are exposed to media for well more than six hours per day. Half of teens live in households where there are no rules about TV exposure, and among the other half only one of five reports that those rules are actually enforced. Many of the most popular films among teens include scenes and references to drug use, seldom with any portrayal of social disapproval or negative consequences. Studies of websites accessible to any youth with computer access report ubiquitous – and highly detailed – pro-drug content, ranging from where to buy marijuana seeds, how to beat a drug test, and how to make methamphetamine. And anyone familiar with current trends in blogs and personal-space websites knows of the overwhelming pro-drug content, readily accessible to teens without their parents having any knowledge of such troubling exposures or risks to their children.

Failure to continue the Campaign's efforts to counter such messaging is the equivalent of raising a white flag to those who favor drug legalization, with the expectation that youth drug use soon would begin to rise, reversing years of hard-earned positive news. Compounding the problem is the fact that the news media seldom cover the risks of drug use to teens, but often report on the use of drugs by celebrities and others in the public eye, as well as efforts to legalize drugs and promote so-called medical marijuana.

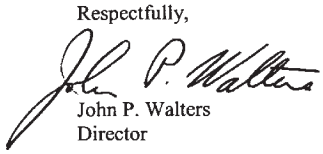
In addition, further cuts to the Campaign likely would create a chilling effect on those media companies who have donated well over a billion dollars worth of media time and space to ensure youth receive anti-drug messages, as well as those ad agencies – more than 80 to date – who have contributed their creative talents towards reducing teen drug use. The Partnership for a Drug-Free America, whose efforts helped persuade the Congress of the need for this Campaign, has been singularly effective at recruiting private sector largesse to this important goal. Such resources are essential to the success of our efforts.

Conclusion

As always, I remain interested in finding ways to improve the performance of the Campaign, as well as other efforts within the scope of the National Drug Control Strategy. I, too, once was skeptical of the ability of a media campaign to make a difference. Due to our considerable energies spent to re-focus and strengthen the Campaign, I have come to believe it is among the most important tools we have to reduce teen drug use. Much is at stake and we must work together to overcome the unwarranted cynicism over whether we can reduce drug use

among America's teens. We can, we have, and we will continue to do so, using the best available means we have at our disposal.

Respectfully,



John P. Walters
Director

7

Appendix III: GAO Contacts and Staff Acknowledgments

GAO Contacts

Nancy Kingsbury, 202-512-2700
Laurie E. Ekstrand, 202-512-8777

Acknowledgments

In addition to the contacts named above, contributors to this report included David P. Alexander, Billy Commons, James Fields, Kathryn Godfrey, Mary Catherine Hult, Jean McSween, Karen V. O'Conor, Mark Ramage, William J. Sabol, Barry J. Seltser, and Douglas Sloane.

GAO's Mission

The Government Accountability Office, the audit, evaluation and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday, GAO posts newly released reports, testimony, and correspondence on its Web site. To have GAO e-mail you a list of newly posted products every afternoon, go to www.gao.gov and select "Subscribe to Updates."

Order by Mail or Phone

The first copy of each printed report is free. Additional copies are $2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to:

U.S. Government Accountability Office
441 G Street NW, Room LM
Washington, D.C. 20548

To order by Phone: Voice: (202) 512-6000
TDD: (202) 512-2537
Fax: (202) 512-6061

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm
E-mail: fraudnet@gao.gov
Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Gloria Jarmon, Managing Director, JarmonG@gao.gov (202) 512-4400
U.S. Government Accountability Office, 441 G Street NW, Room 7125
Washington, D.C. 20548

Public Affairs

Paul Anderson, Managing Director, AndersonP1@gao.gov (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, D.C. 20548

PRINTED ON RECYCLED PAPER